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Vol. 1 No. 8 December 1985 £1

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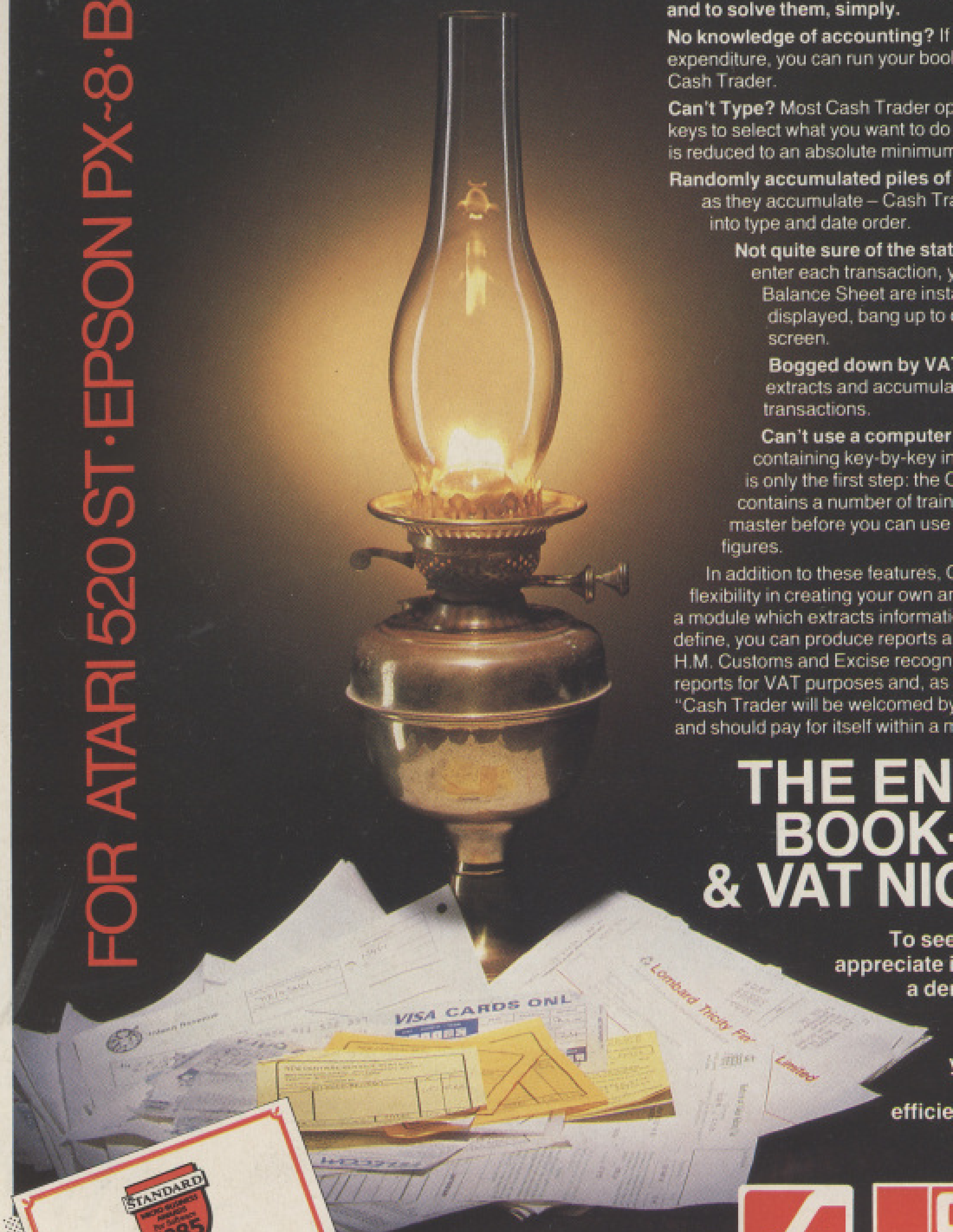
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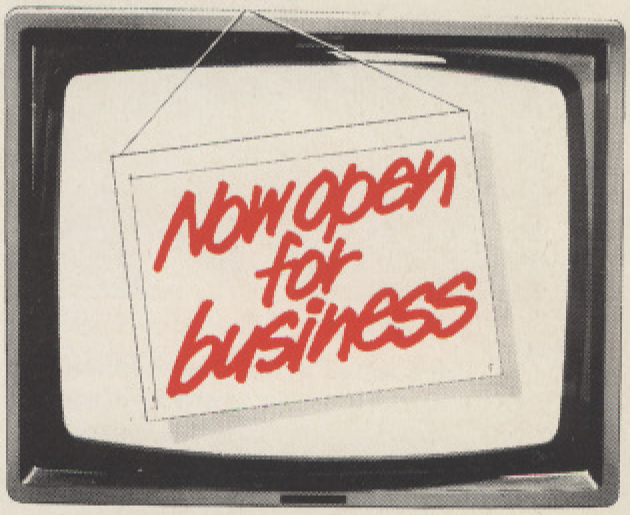
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The computer that's been giving you such a fun time with games now gives you the chance to earn some money. Helping you with word processing, secretarial work and even running your own business. All because of the brilliant new word processing package, SuperScript from MicroPro — the makers of WordStar — the world's best selling word processing packages for microcomputers.



SuperScript **writes letters, invoices, reports, tables, documents, it stores, edits and even checks spelling.**

Versatile SuperScript SuperScript combines word processor, spelling checker, calculator and mail-merge facility, all in one package. So SuperScript gives you all the tools you need to produce high quality reports, tables, lists, personalised letters and prints labels quickly and efficiently.

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Each command is a single word, and for each command you simply move the cursor. You don't even have to type the command.

Good with numbers SuperScript allows you to extend your editing line up to 250 columns for wide documents like financial statements, and with decimal tabs it's easy to enter properly justified tables of numbers.
SuperScript's complete set of calculator functions can be used interactively or you can operate on numbers from the text of your document. Apart from the usual mathematical functions like add, subtract, multiply, divide, and percentages, you have the ability to add rows, columns or even whole tables.

Good with spelling, too The build-in spelling checker goes right through your text, checking for errors. You have the option to correct any error, ignore it, or add the word to its 30,000 word dictionary.

Editing options SuperScript gives you all the editing options of a business-style word processor, with full block manipulation for cut-and-paste; overtype or text insertion modes; search and replace with pattern matching and optional case discrimination; backward search, case shifts for single words or larger blocks of text. And much more.

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If you are intending to use SuperScript for a specific purpose, we should be interested to have details. Thank You________



Vol. 1 No. 8 December 1985

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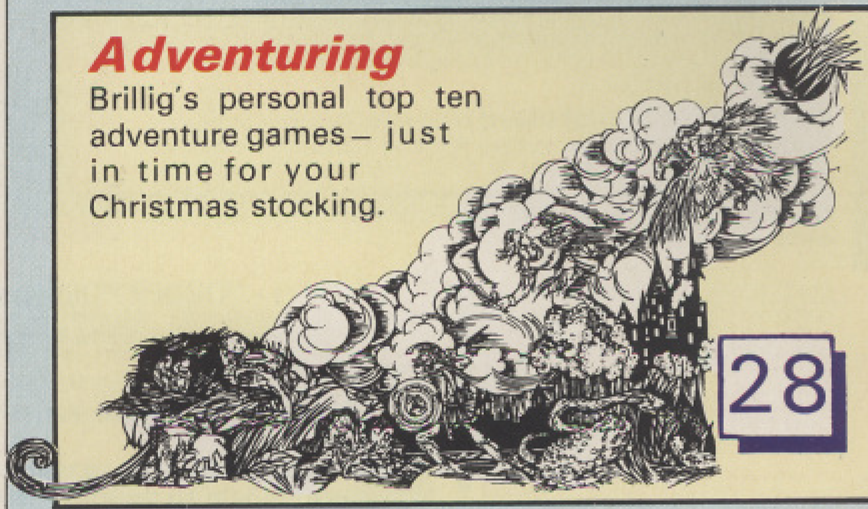
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"Atari User" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all-rights basis.

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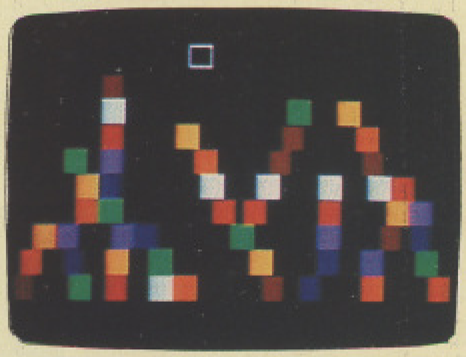




Contents

FREEBIE

This month's Freebie for *Atari User* disc and tape purchasers is guaranteed to entertain and delight you. And there's not an alien in sight.



See Page 66

Here's a

IBM, Epson QX-6,

Acorn Electron, ACTS

Ericsson...and th

that fits them all–the

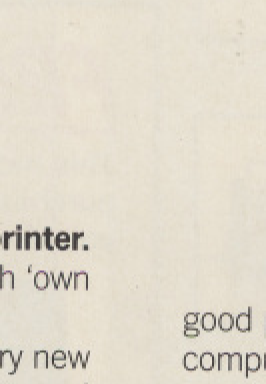
At last, your computer can have an Epson printer.

Even if it's only supposed to be compatible with 'own brand' printers (like Atari).

Our latest printer, the GX-80, has a revolutionary new interface called PIC (it means Printer Interface Cartridge and that's it on the right). The cartridge slips into the back of the GX-80 and enables the GX to understand commands from the host computer.

So if you've ever wanted to have an Epson printer for your micro but thought you couldn't, here it is.

But first, read about the GX-80's other cracking advantages . . .



What happens when I change computers?

Gone are the days when you had to scrap a perfectly good printer just because it 'didn't go with' your new computer.

Once bought, your GX-80 stays put. (Epsons tend to stick around for ages anyway; now we've taken tradition a little further.)

When the time comes to upgrade your computer, you simply go back to your Epson dealer and buy the corresponding new PIC.

It's a far sight cheaper than being forced to sell/scrap out your printer only to buy another one. And in effect it makes the GX-80 your printer for life.

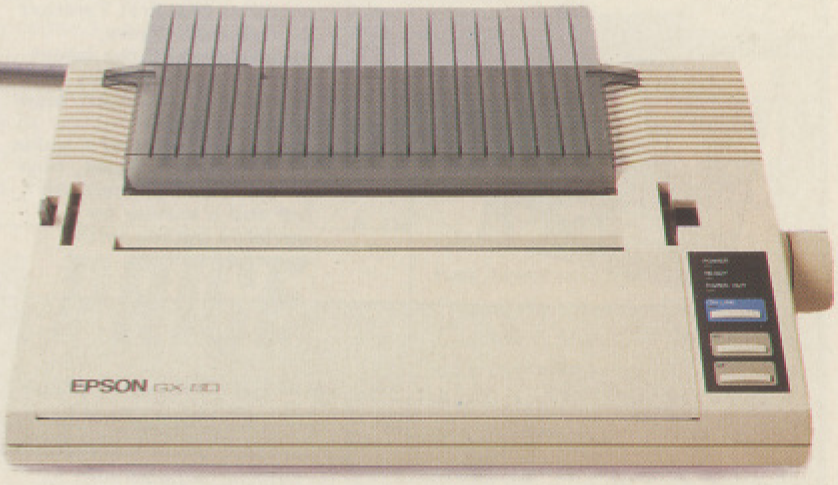
's a plug for any Atari,

-16, Apple IIc, BBC,

T Sirius/Apricot, Compaq,

this is the printer

e new Epson GX-80.



A printer for life? What's the catch?

Sheer, unremitting boredom.

The GX-80 takes all the fun out of printer ownership. You can't shout, "Lousy printer! It's fouled up again!" because it won't. It's just as reliable as every other Epson.

Nor can you gleefully chuck it merely because you've changed computers — PIC's seen to that.

But all is not lost. You could change your computer a bit more often. Just for fun.

EPSON

Epson (UK) Ltd., Dorland House, 388 High Road, Wembley, Middlesex HA9 6UH. Telephone 01-902 8892.

- -

I'm looking for a permanent relationship too. Tell me the rest about the GX-80 with PIC.

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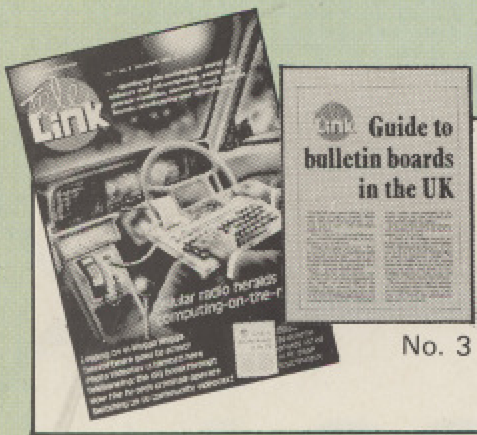
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Special supplement: Guide to Microcomputing on Prestel. Contains hundreds of page numbers covering games, education and business and utility programs for the BBC, Apple, Commodore and Spectrum. Plus hints, tips and reviews of comms products.



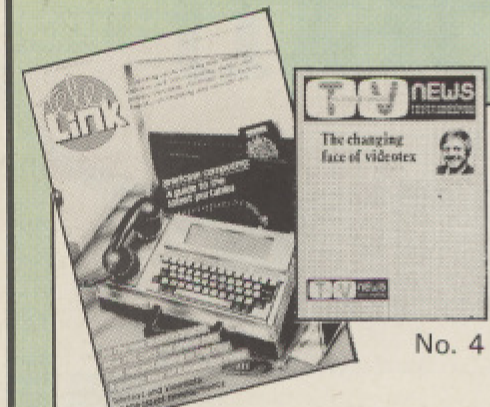
No. 2

Special supplement: Guide to Communicating with your Micro. All you want to know about user-to-user communications, protocols, how modems work, an introduction to networking and PSS. Plus a guide to 39 modems listing all their special features.



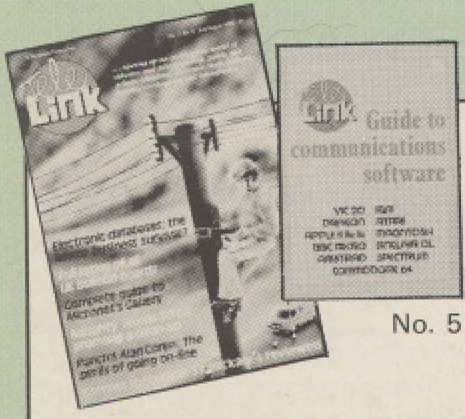
No. 3

Special supplement: Guide to Bulletin Boards in the UK. An in-depth survey of what bulletin boards offer and what they cost, how to access them, interviews with 12 leading sysops. Plus a complete listing of 39 bulletin boards, pinpointed on a map of the UK.



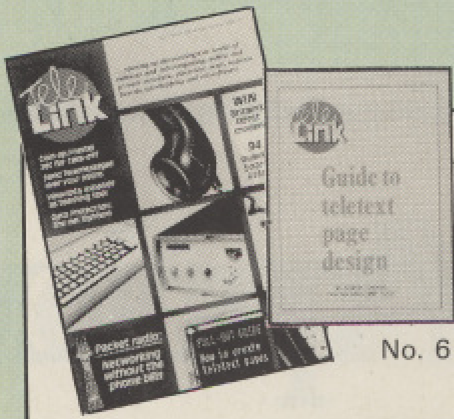
No. 4

Includes the first Teletext & Viewdata News, highlighting all the latest industrial news. Plus features on financial, legal and educational databases, start of a guide to Knowledge Index, how to work out your phone bill and a survey on portable micros with comms facilities.



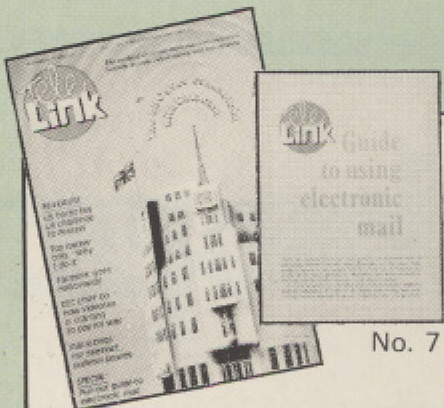
No. 5

Special supplement: Guide to Communications Software. A survey of 37 communications software packages for 11 of the most popular micros. Plus advice on viewdata graphics, description of the de facto standard for UK bulletin boards, Xmodem, and online humour from Punch editor Alan Coren.



No. 6

Special supplement: Guide to teletext page design. A leading expert tells how to achieve eye-catching viewdata graphics. Plus all about coin-operated Prestel, setting up educational viewdata systems, using packet radio to cut phone bills, on-line credit reporting.



No. 7

Special supplement: Guide to using electronic mail. A detailed expert introduction to electronic mail's time-saving and cost-cutting features. Plus a challenge to Prestel's monopoly, launch of the BBC's Datacast, interview with a top US hacker, and how Farmlink is branching out.

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Silence over Comdex

ATARI bosses were being tight-lipped about what surprises the company would spring on the computer industry at the giant Comdex exhibition in Las Vegas.

Rumours circulating in the trade during the count-down to the show said the firm was poised to announce a number of new additions to its ST family – among them a 1mbyte model, the 1040ST.

One report said the new machine would be offered here with a colour monitor for about £1,000, be upwardly compatible with both the planned 260ST and existing 520ST, and feature a built-in 720k formatted capacity disc drive.

It was also thought that Atari would preview its 32 bit workstation, the TT, based on the 32032 processor.

But sales and marketing manager Rob Harding dismissed the rumours as "pure speculation, completely unfounded".

He told *Atari User:* "I have no knowledge of these products being shown at Comdex, but even if they were it wouldn't necessarily mean we would bring them on to the market.

"We tend to use exhibitions as shop windows to show we are capable of producing certain types of products.

"Mass production doesn't necessarily follow – after all, look what happened to the 130ST".

Half-price 800XL hits the Christmas marketplace

ATARI is poised to dominate the UK micro market this Christmas as a result of striking a multi-million pound deal with Dixons.

It involves the sale of the entire stock of 800XLs – some 100,000 machines – to the High Street giant.

Now Dixons are slashing the price of the 800XL package by 50 per cent, bringing the cassette version down to just £99.99 in the run up to the festive season.

The cut price offer includes an 800XL, joystick, 1010 cassette recorder and five pieces of software, which would have usually retailed for a total of £197.

At the same time the 800 stores in the Dixons chain – which now also includes the Currys outlets – will also be offering the 800XL with disc drive and three pieces of software at a bargain price of £169.99, down from £300.

"They will be selling an awful lot of 800XLs in the run up to Christmas", says Rob Harding, Atari UK's marketing boss.

"In fact this will mean that this year Atari will not simply be a leader but will actually dominate the entire market".

The company has gone to considerable lengths to ensure that independent dealers are not left with stocks of 800XLs and so be unable to compete with the new High Street prices.

But Atari has retained a small stock of the machines to ensure that any outstanding Christmas orders can be filled.

However production of the 800XL will now cease, with Atari concentrating on the 130XE as its ongoing machine in the 8 bit market.

"We are currently looking into special packages involving the 130XE as well", Rob Harding told *Atari User,* "and these will be available any day now".

Production is also to end of the 1010 cassette recorder and this will be replaced by a new XCL model.

Made in Japan, this will be powered internally from the 130XE, and will retail at the same price as the 1010 – £34.95.

Atari has also announced that it is to slash the price of its 1050 disc drive from £199 to £130.

"With what we are now offering the public, there will be nothing to prevent Atari running away with the market this year", says Rob Harding.

RAM discs for ST

A NEW utility enabling one or more RAM discs to be set up on Atari ST micros for increased speed of operation has been released by Kuma Computers. The company says its K-Ram package enables files to be accessed and written to between 40 and 50 times faster than with a normal disc drive.

Additional features include a Help facility and an option for decreasing floppy disc write times by up to 50 per cent. K-Ram can also enable the user to gain more free RAM by configuring the operating system, says Kuma. Price: £29.95.

ROM UPDATE – AT A PRICE

THE long-awaited ROM version of the 520ST's operating system should be available here before Christmas. But it will cost ST owners about £25 for the kit to upgrade their machines.

Although the ST was originally expected to arrive on the market with a ROM system, the machines sold in the UK up to now have all been disc based.

Many people who bought these machines did so believing they would eventually be able to make discs-for-ROMs trade-ins at little or no cost.

But this is not to be the case. Atari UK marketing boss Rob Harding said: "There will be a small charge to existing ST owners for the upgrade kit. I expect it to be about £25.

"I believe this to be reasonable. The disc operating system was never intended to be a stopgap until the ROM version became available.

"It has always been an option, just as the ROMs will be an option when they become available any day now.

"Many existing ST owners aren't interested in running Gem programs – they are quite happy with the disc operating system in view of all the BOS software that is available".

An informed source says the 520ST ROM chips are currently completing their Beta testing before going into full duplication and should be available soon.

1-2-3 clone released

AN enhanced Lotus 1-2-3 clone has been released in the United States for the 520ST.

Called the VIP Professional, its extras include GEM interface, 16 colours, multiple windows, mouse compatibility and pull down menus.

Available from VIP Technologies of Santa Barbara, California, its current $99 price tag – claimed to be three times lower than that of its rival – is due to rise to $149 in November.

A full tutorial is included in the price.

Hacker emulator

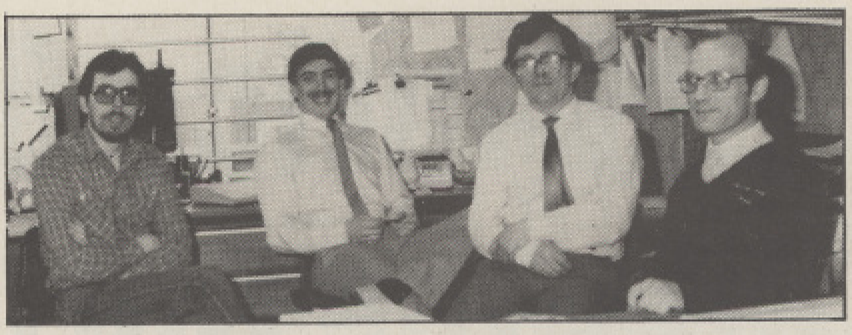
ATARI users can now emulate hackers – the electronic burglars who break into computer systems – but without fear of being caught.

It is all thanks to a new adventure-type game called Hacker from Activision. The company claims it is a challenging simulation of what a user might experience if he were to "accidentally stumble" into a foreign system.

The aim of the game is for the user to decide how to proceed in search of information which will help save the world.

The usual instruction book and hints have been deliberately left out so once the computer has been given the logon command the user is on his own.

Prices are £14.99 for the disc version and £9.99 for cassette.



BIRTHDAY BONANZA

MAIL order house Software Express is celebrating its first birthday this month, by giving presents to its customers.

Atari owners who have bought goods from the firm have been sent an entry form for three free competitions offering prizes of software and hardware.

One is for the best birthday card designed by computer graphics and can be submitted either as a print out or screen photograph.

In the second competition contestants have to guess the actual day in December on which the firm's birthday falls.

The third competition involves identifying a product in the firm's catalogue with the help of a cryptic clue.

Software Express general manager Jerry Howells said: "In addition each week during the month a selected range of products will have their prices cut right down to the bone.

"And we will also have a special phone-in 'Make us an offer' service where customers will be invited to name their own prices for the goods they want.

● *The Software Express team picture above (left to right) Ken Howells, Jerry Howells, Mike Jones and Pete Fellows.*

p-System for the 520 ST

ADVICE and information about p-System for the Atari 520ST will be one of the main topics on the agenda at the eighth USUS-UK conference at Oxford Moat House, December 12 to 14.

The keynote address will be delivered by Eli Willner, whose company is currently negotiating for the rights to p-System, the mini operating system for software developers.

Other topics include high quality code generators, low cost CAD systems, networking, and there will be presentations by software houses that have developed multi-user applications.

Overseas companies attending this year include Stride Micro and Elia Computer from America, Focus from Germany, Versal from Sweden and Symbiotic from Norway.



Tough cookie..

THE new Mach 1 joystick for the Atari was built to withstand immense punishment, claims Cheetah Marketing.

It also has three fire buttons. Two – the trigger and thumb buttons – are on the moulded handgrip. The third, for two-handed firing, is on the base. There is also an auto fire switch.

The base can either be hand held or stuck firmly on a table using its under base suckers.

Price: £8.95.

pForth gets the seal

THE first British package to get the new Atari Approved Software seal of approval is pForth, a multitasking system from Bignose Software said to provide a complete development environment for the 800.

Among many features normally only found on mini and mainframe systems is the ability to run simultaneous tasks on the machine.

Used in conjunction with a serial comms card the system allows the 800 to be used as a multiuser development system or to service several incoming calls on a bulletin board simultaneously. Price: £49.95.

TEACH-IN FOR THE ST

PUBLISHERS Glentop are producing a range of teach-yourself style books for the 520ST.

Titles have yet to be finalised but five books are due, covering subjects such as an introduction to the machine, Basic, machine code, ST Logo, graphics and the advanced user.



New link to micro

THE near letter quality GX-80 nine-pin dot matrix printer from Epson features a printer interface cartridge which makes it compatible with the Atari 600 and 800XL.

Based on the LX-80 launched earlier this year, the printer features a new method of connecting up to a computer.

At its back, instead of the normal Centronics connector, there is a space for users to fit the PIC of their choice with a cable and plug all in one.

An optional tractor feed and cut sheet feeder for word processing input are available.

Printing is bi-directional in draft at 100 characters per second and 16 cps second pass, in Roman NLQ.

The printer incorporates fount selection from the front panel to give choice of Pica, Elite and Roman as well as emphasised, condensed and double strike Pica.

Italics, sub/superscript, emphasised, enlarged and underlining are also available through Epson software control.

Price of the GX-80 is £249, the printer interface cartridge £50, sheet feeder £55 and tractor unit £20.



High-tech steam trip

DISTRIBUTOR Eltec Computers chose to step back into the past when introducing the latest Atari technology to 100 of its dealers from the Midlands and North.

The company hired a steam engine and old fashioned carriages preserved and operated by the North Yorkshire Moors Steam Railway for a scenic trip from Pickering to Grosmont.

During the journey a range of products from Atari, including the new 8 bit 130XE and 16 bit 520ST were demonstrated.

Guests from as far south as Birmingham viewed the new range of products now available to them courtesy of Eltec's recent contract with Atari giving it distribution rights throughout the North.

Eltec sales and marketing director Roger Purssglove said afterwards: "Both products were very well received. The Atari machines not only offer a total package but also fill a large gap in the market at an extremely realistic price".

Atari UK sales and marketing manager Rob Harding described the novel computer demonstration as "an auspicious start to what I hope will be a long and mutually beneficial business relationship between Eltec and Atari".

Piracy fighter raps smear

THE president of an Atari user group has become the victim of high tech character assassination.

Ken Ward, leader of the Norwich User Group, says smear tactics are being used to link his name with software piracy among the Atari fraternity.

An aggressive and outspoken opponent of the micro cheats, Ward believes the current campaign against him was sparked by an article he published in a recent issue of Nugget, the user group's newsletter, attacking piracy.

"This article appears to have upset a certain Atari owner and I have received a hoax parcel and several letters thanking me for providing contacts dealing in pirated software", he told *Atari User*.

"My name is being used on disc files containing pirated software which are being passed around the Atari community. Over the past two and a half years I have put a lot of work into building up a respectable group and newsletter.

"We have gained a status and respect that is the envy of other groups.

"We have members all over the country and we are slowly gaining the confidence of the software industry.

"I don't intend to let a sick Atari user undermine that respect and confidence, and I am making my own enquiries to try and track down this person and get more evidence so I can take action against him.

"This particular nasty specimen is under the delusion that he is an intelligent Atarian.

"He's wrong – he's just a snivelling little pirate who should be put down before he does any more damage".

FOUR FOR THE STs

SOFTWARE house Microdeal has licensed four programs for the Atari ST range from American publisher Michtron and will be releasing them during the next month. They are an arcade game, Mudpies, and a board game, Flipside, each priced £19.95, a Ram disc emulator, M-Disc, and a print spooler, Softspool, each at £29.95.

Zork on the ST

AMERICAN software developer Infocom has announced a line of 16 interactive fiction products for the Atari ST.

The range includes best sellers such as the Zork Trilogy, Hitchhiker's Guide to the Galaxy, and Wishbringer.

Prices of the Atari ST versions will range from $39.95 to $49.95 depending on the level of difficulty.

War game released

THE controversial war game Theatre Europe from PSS has been released for the Atari 400/800 XL series.

Based around a conflict between Nato and the Warsaw Pact countries, Theatre Europe is a simulation of the possible outcome of World War III.

The player has the choice of sides with the computer as the opponent. Chemical or nuclear weapons may be used to the point of world destruction. Price is £9.95.

Mind blowing

SOFTWARE house Activision has released its text/graphic adventure Mindshadow for the Atari 800XE and XL.

The player finds himself on a deserted beach suffering from amnesia and must make a complex journey round the world to rediscover his identity.

Described as "a living computer novel", Mindshadow costs £14.99 on disc.

Sci-fi adventure

WORM in Paradise, the third part of the Silicon Dream trilogy from Level 9 Computing, has been released for the Atari 48k machines.

It follows Snowball and Return to Eden and is described as a political science fiction adventure set in a future state where something has gone wrong with man's dreams and ideals and the player has to beat the system and escape to reality. Price: £9.95.



THE 520ST. OVER QUAL

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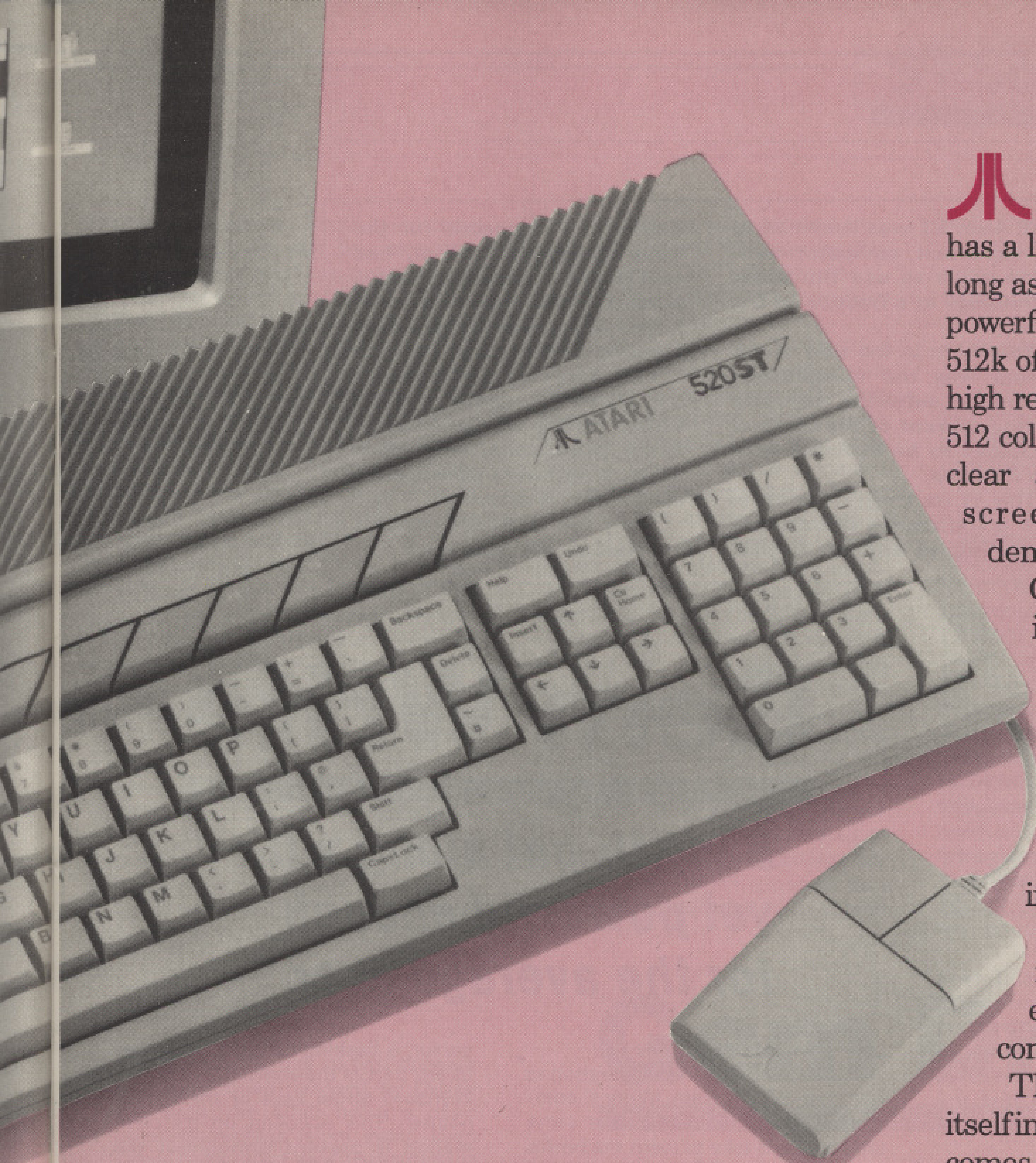
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Screens.



THE ATARI 520ST Personal Computer has a list of qualifications as long as your arm. With a powerful 16 bit processor and 512k of memory linked to high resolution graphics and 512 colours its work is fast, clear and sharp on your screen, no matter how demanding the task.

Controlling the 520ST is easy through its mouse and unique operating system incorporating GEM desk top manager, whilst its eleven peripheral connectors including MIDI interface enables it to mix and communicate easily with other computer products.

The ST which presents itself in smart modern styling comes with powerful BASIC

L IFIED AND UNDERPAID.

plus Logo programming languages, a word processor and drawing programme, yet costs only £652* including disc drive and black and white monitor.

Why? Because at Atari we bring up our products to work hard for their living.

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*This price is exclusive of VAT.
GEM ® is a registered trademark of Digital Research.

THE Atari ST was launched to an expectant computer audience eager to use the latest technology at a fraction of the price.

The thorn in the side of the launch was the conspicuous absence of software, including a large amount of the bundled packages to be included with the machine.

This is no longer the case, with a wide range of software beginning to appear. Digital Research, responsible for the Gem operating system, has now got its act together and is producing packages to take the fullest advantage of the Gem working environment.

The first two of these are about to appear – Gem Write, which is the bundled word processor, and Gem Draw, a software package for diagrams and drawings.

Here are JEREMY VINE's impressions of them both.

Gem Write

Easy to get along with yet powerful enough for the average user

WORD PROCESSING is almost certainly the most common application in business computing. Even for the home user, a word processor has become an essential package to possess. Gem Write is a basic word processor which offers the essential commands for writing documents.

As a thrown-in part of the ST package, I wasn't expecting too much. So how did it fare?

As a technical journalist I have probably used more word processors than I care to remember, and one outstanding feature of most packages is the amount of time it takes to become acquainted with just the rudimentary commands, let alone all the facilities.

Gem Write is almost unique in being delightfully simple to use yet powerful enough to offer sufficient facilities to provide for the average user – whoever that may be.

It would not be an exaggeration to say that all of Gem Write's commands can be learned in the same time it would take to learn the basics of another package. This owes much to the Gem philosophy.

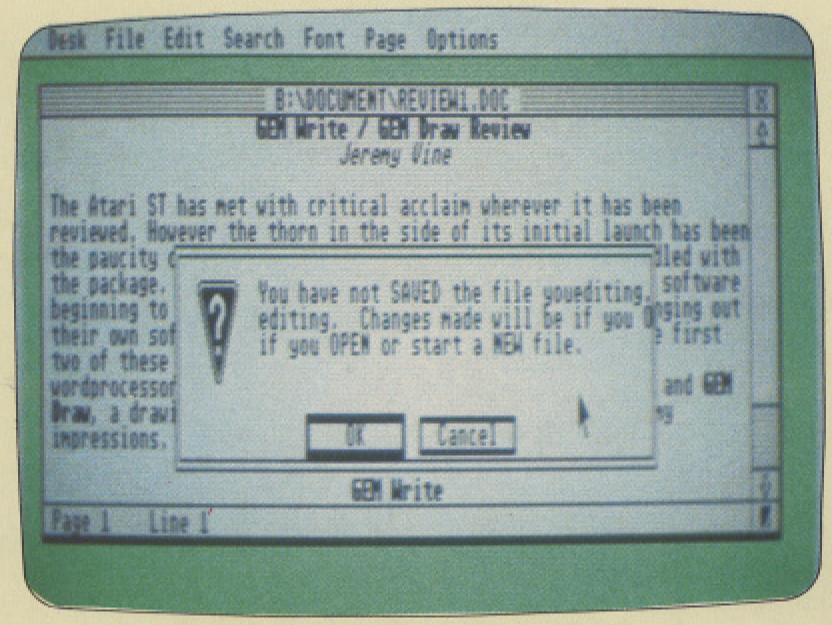
On loading Gem Write the user is faced with a blank window. The cursor, a flashing bar, can be moved to any part of the screen by using the keyboard arrow keys or the mouse pointer. This doubling up on commands is present throughout the package and allows interaction between mouse and keyboard controls or just keyboard, though the former is the most likely scenario.

The typing starts from wherever the cursor is placed and text is automatically wrapped round at the end of a line.

The Edit menu offers the standard facilities of inserting, deleting and centering lines and moving, copying and deleting blocks of text. These commands, as for many others, rely on the user highlighting the text to be affected – that is, moving a block of text. This couldn't be simpler.

Using the mouse, the user need only move the cursor to the beginning of the text to be affected and drag the cursor – mouse button held down – over the desired area. This causes the text to be highlighted in inverse video – white text on a black background.

It is then only necessary to choose the desired command from the



Gem Write: Still some bugs to be ironed out

pull-down menus. These commands can be carried out by using the keyboard function keys, sometimes in conjunction with the Control or Shift keys. But that's old fashioned. Well, it's there if you like it that way.

In a similar way the Font menu can be used to change the style of the text. This turned out to be quite a disappointment, as there was little choice of styles, Gem Write only allowing the text to be printed in normal, bold or italic print, plus the facility of underlining.

In comparison, Gem Draw – reviewed below – had more text variety on offer, which seemed slightly strange. It would have been no problem to provide a range of font styles, and this was certainly a weak point in this package.

All changes made to text are shown on screen, which makes a pleasant change to just seeing control codes all over the place. However these codes can be seen by the user on pressing a function key.

Graphics can be cut into the text using the Insert Graphics command from the File menu, as can text from another document. Whereas inserted text appears in the document, graphics from Gem Draw or Gem Paint did not on my version.

It seems that an embedded command is placed at the appropriate spot in the document and on printing the picture is cut into the document. The user can specify to see the picture using the Turn Graphics On command, though I could not get this to work.

Rulers, tabs and margins can all be set from the Page menu, as can the format of the document – justification, pagination, line spacing, page length, margin, etc. The Search menu allows text to be found and replaced, the user also being able to specify which page to be shown on screen.

At the end of each physical page, not the screen page, a page-break line is shown. The arrow keys on the keyboard allow the document to be scrolled in either direction vertically, with jumps of a page facilitated by use of the arrow and Control key. However there didn't appear to be a means of scrolling by each screen, which was annoying.

A Shortcuts option on the Options menu acted as a help guide to the function keys, which was necessary as there is no way to remember what each function key did on the ST keyboard.

VERDICT: As part of the ST package Gem Write is a good word processor. If I had to buy it separately I would have more reservations, but as it stands Gem Write does its job and will suit the needs of many ST owners. I would be more than happy to use it and probably will.

My only gripe was that it did not have a word count facility – useful to us journalists, but maybe I just expect too much.

The more demanding of us may have to wait for another word processor, but as a freebie package I really can't complain.

Gem Draw

Not a professional CAD package, but it's fine in its line

GEM DRAW is one of two drawing packages to be released by Digital Research, the other being a basic painting package, Gem Paint. Gem Draw is intended as a computerised drawing board, allowing the user to mix text and graphics on-screen, to create diagrams or drawings. Like all Gem packages, Gem Draw takes full advantage of the Wimp (windows, icons, mouse, pointer) system and the package is entirely controlled from the mouse.

The menu bar runs across the top of the screen and offers eight pull-down menus, excluding the Desk one. They are used in conjunction with a range of drawing tools shown vertically on the left of the window.

Options range from drawing circles, ellipses, rectangles and squares to the user drawing in his own free-hand style. Text can also be freely mixed into the drawing. But more of this later.

When first loaded Gem Draw displays a blank area within the window on which the user draws. However it is not the entire area on which the final output will be printed, but merely a window on a much larger drawing board.

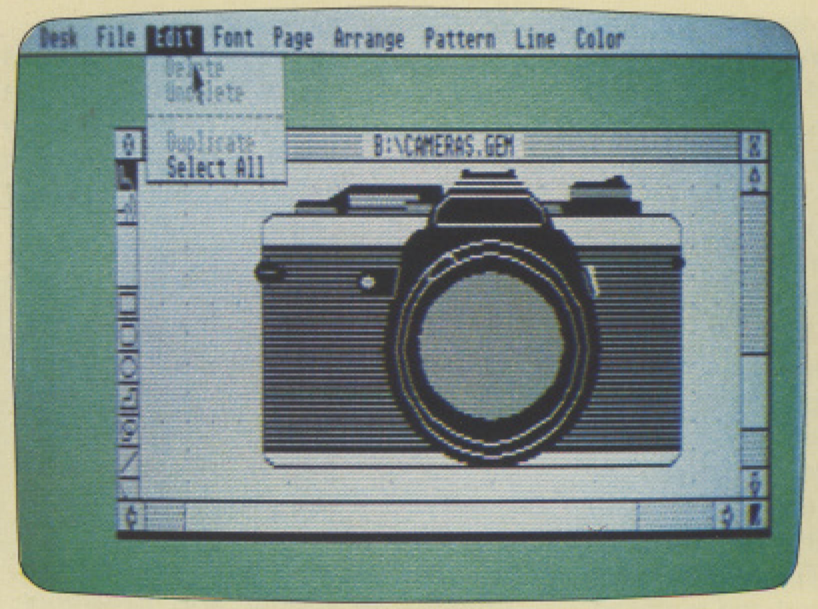
Moving the mouse pointer over the second option on the vertical menu causes Gem Draw to show a reduced version of the entire board. This is particularly useful on plans and diagrams that spill beyond the drawing area usually shown. It is also of assistance when using the Zoom facility (see later).

When anything is drawn, regardless of size or shape, a box is immediately placed around it. The boxed area defined is determined by the end of a drawing action by the user. In other words, once the user releases the mouse button – which usually triggers the particular drawing event – the last element drawn is surrounded by a box.

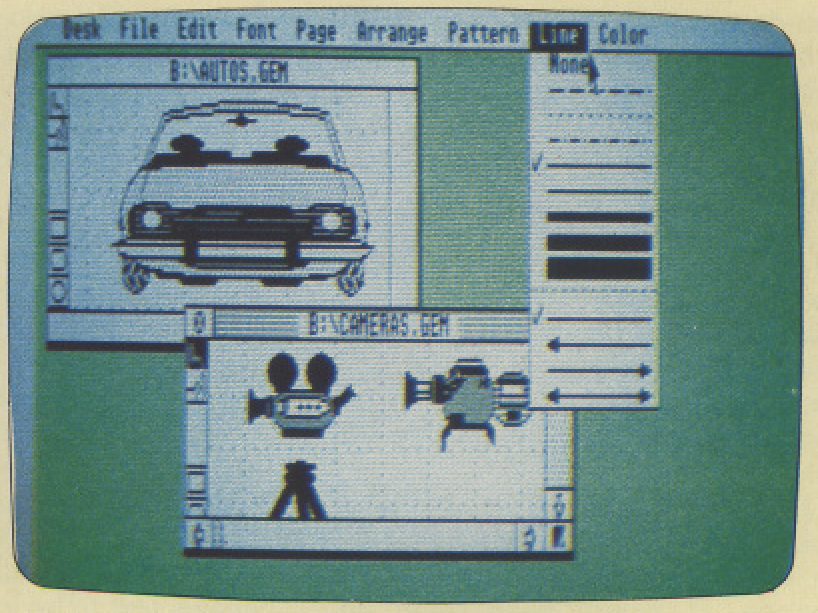
At a later stage the user can then place the mouse pointer over a certain part of the picture and find out how many elements make up that area of the drawing.

Each of these boxed areas can be moved independently on the screen. This means that a drawing of say, a camera, might be made up of several component parts, each of which can be separately manipulated.

If the lens of the camera is



Gem Draw: A delight to use



A wide choice of lines available

surrounded by a boxed area the user can then remove the lens by pointing to the box and dragging the lens to another part of the drawing. In this way the user can break a drawing into its smaller component parts and fit them together at a later stage to make a complete picture.

The options for drawing ellipses, circles, rectangles and squares are activated by placing the pointer over the relevant box and clicking the mouse button. The pointer then changes shape from an arrow to a cross-hair and the option chosen is highlighted by a black background.

Executing the drawing action is then a case of holding down the left mouse button and dragging the cursor till the shape/line is the appropriate size.

Once the mouse button is released a box is shown around the drawing element completed. Before going any further, the user can at this stage use the Pattern, Line or Colour menus to complete the drawing element.

The Pattern menu displays 39 shading patterns which fill the area shown by the box. Therefore if the user has just drawn a square it can be filled in by pulling down the Pattern menu and choosing a specific pattern – brick wall, vertical lines, and so on.

Like all Gem commands, the mouse needs only to be clicked over the desired option and the shape is redrawn with the chosen pattern filling the area within the shape.

The Line menu allows the user to choose how thick a line is drawn, whether it is broken, dotted or connected, and also adds a nice touch of placing arrows at the ends of lines – very useful if you are drawing flowcharts.

Finally there is a colour menu to choose a drawing colour, providing of course that you have a colour monitor. If using a monochrome monitor there is only a choice of black or white.

There is, of course, a File menu which offers all the usual filing utilities such as Saving and Loading pictures, and the output to a printer. The format of the page – document size, etc – is changed using the Page menu, as is the use of grids and rulers. The size of the grid can be changed using one of six preset sizes and a ruler can be displayed horizontally along the top of the window if needed.

The Page menu offers also a Zoom facility which, as the name suggests, allows a specific area of the drawing to be shown in closer detail. This is an excellent method of touching-up and examining the finer details of a drawing.

As the zoom facility is used the picture often zooms into an area which the user does not wish to enlarge. This is where viewing the entire drawing board is useful, as the user can then see exactly what area is being magnified (shown by an outline box).

The outline box represents the window in which the user works, and this window can then be placed over the area to be magnified.

Text can be placed anywhere on the screen and the Font menu allows the user to specify different character fonts, size, italics, and so on. It was interesting to note that the Font menu offered more choice than the equivalent option in Gem Write.

Elements of a drawing can be deleted, and undeleted, using the Edit menu, which also has a Duplicate option to make a copy of any drawing element.

Finally comes what was for me the best part of Gem Draw – the Arrange menu, which aids the user in placing objects or elements of a picture wherever the user desires.

Drawings can be specifically placed behind or in front of another drawing. The user merely has to identify the drawing element and then place it over another drawing. The facility can also align drawings on the screen, as well as centering drawings on the page.

VERDICT: All in all, Gem Draw was a delight to use and like Gem Write could be put to work immediately. Its uses will no doubt be varied, though it will probably appeal to less professional use.

For computer aided design applications the package does not have sufficient options to make it a professional's tool. A pity really, but I suspect this is not the intended market. Having said that, I enjoyed using the package and it is a welcome addition to my programming library.



What it offers the Atari user...

Give your micro mainframe power

With MicroLink your micro becomes a terminal linked directly to the Telecom Gold mainframe computer, and able to tap its tremendous power and versatility. Right away you'll be able to use giant number-crunching programs that can only run on a mainframe. You can set up your own computerised filing systems, store and update statistics and other information, cross-reference material between files, selectively extract the information you want, perform massive calculations and design reports to display information from any of the files and in any format you choose.

The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. New ones are springing up in all parts of Britain and all over the world, with people of like minds chatting to each other on all manner of subjects. The only snag is that the vast majority are single-user boards – which means lots of other people are also trying to make contact and all too often all you get is the engaged tone. But with the MicroLink bulletin board there is no limit to the number of people using it at the same time. And no limit to the number of categories that can be displayed on the board.

We're only a local phone call away

More than 96 per cent of MicoLink subscribers can connect to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PSS system, which has access points all over Britain. A local phone call is all you need, too, for access to the international Dialcom system through MicroLink.

Telemessages – at a third of the cost

The modern equivalent of the telegram is the telemessage, which if sent before 8pm is delivered by first post the following day (except Sunday). Originally designed for people to phone their message via the operator, the service costs £3.50 for 50 words. Now it's available via MicroLink – and costs only £1.25 for up to 350 words!

Send and receive telex messages

With MicroLink you can turn your micro into a telex machine, and can send and receive telex messages of any length. You will be able to communicate directly to 96,000 telex subscribers in the UK, 1½ million worldwide – and even with ships at sea via the telex satellite network. Business people can now send and receive telexes after office hours, from home or when travelling. You can key in a telex during the day and instruct MicroLink not to transmit it until after 8pm – and save 10 per cent off the cost!

The mailbox that is always open

MicroLink is in operation 24 hours a day, every day. That means you can access your mailbox whenever you want, and from wherever you are ... home, office, airport – even a hotel bedroom or golf club! No-one needs to know where you are when you send your message.

What does it all cost?

Considering all the services you have on tap, MicroLink is remarkably inexpensive. You pay a once-only registration fee of £5, and then a standing charge of just £3 a month. On-line costs are 3.5p a minute (between 7pm and 8am) or 10.5p a minute during office hours. There is an additional 2p a minute PSS charge if you are calling from outside the 01- London call area. Charges for telex, tele-messages and storage of files are given on the next page.

How much it costs to use MicroLink

Initial registration fee: £5.

Standing charge: £3 per calendar month or part.

Connect charge: 3.5p per minute or part – cheap rate; 10.5p per minute or part – standard rate.

Applicable for duration of connection to the Service. Minimum charge: 1 minute. Cheap rate is from 7pm to 8am, Monday to Friday, all day Saturday and Sunday and public holidays; Standard rate is from 8am to 7pm, Monday to Friday, excluding public holidays.

Filing charge: 20p per unit of 2,048 characters per month.

Applicable for storage of information, such a telex, short codes and mail files. The number of units used is an average calculated by reference to a daily sample.

Information Databases: Various charges.

Any charges that may be applicable are shown to you before you obtain access to the database.

MicroLink PSS service: 2p per minute or part (300 baud); 2.5p per minute or part (1200/75 baud).

Only applies to users outside the 01- London call area.

Telex registration: £10.

Outgoing telex: 5.5p per 100 characters (UK); 11p per 100 (Europe); 16.5p per 100 (N. America); £1.15 per 400 (Rest of world); £2.75 per 400 (Ships at sea).

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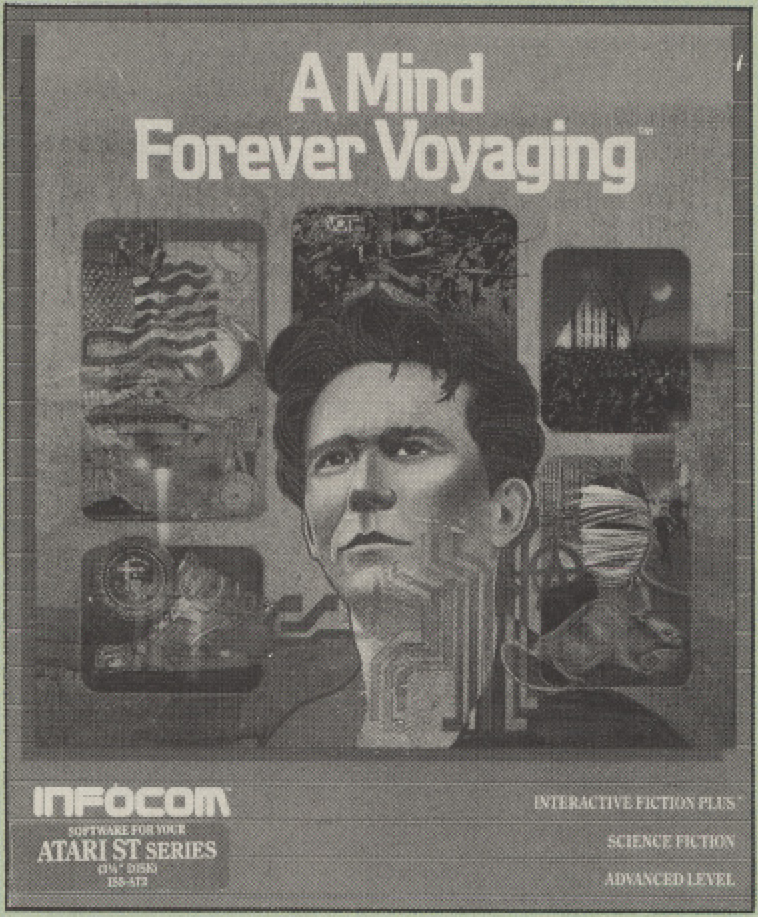
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Into a world of illusions



A NEW product from Infocom is always something to be eagerly awaited, so when I got a phone call to say that a new Infocom title had just arrived in the country I was eager to try it out.

When I found that it was written by the same guy who gave us Planetfall, Sorcerer and Hitch-Hiker's, and that it was only available for the ST, being much too large and complex to fit into the 8 bit range, I was doubly interested.

Thus, the very next day, thanks to the efficient staff at Software Express, I sat down at my desk, powered up the ST, and placed the **A Mind Forever Voyaging** disc in the drive.

And I suddenly discovered that my entire life to date was nothing more than an electronic illusion created inside the massive memory banks of the Prism super-computer.

This fact is, perhaps, a little disconcerting, so I'll explain:

Early in the 21st Century, Doctor Abraham Perelman was involved in a project that would bridge the gap between computer "Expert Systems" and the workings of the human brain.

He proposed an artificial intelligence simulation which mimicked in every way the learning processes of the human brain.

Thus the Prism computer was designed, and hooked into five other massive mainframe computers which would provide the substance of the simulation fed into Prism.

It would be fed from the outside world with everything a normal child could see and hear, and its reactions to this input would cause the projection to alter accordingly.

This process would take many years to complete, in the same way that the human learning process takes many years.

Meanwhile, a small boy was growing up in Downtown Rockvil. He went through all of the normal growth pains of any child in middle America.

He got lost in the local supermarket, was bullied at school, wanted to become a writer . . .

Then, at the age of 13, Perry's father died, and the family moved into an apartment in the more seedy part of town.

At the age of 20, just as he had met and fallen in love with Jill and was thinking of settling down with her, he found himself at a rather strange job interview with a magazine editor.

They were discussing perception – how does one *know* that the real world is not an illusion generated by the mind?

As they talked, everything around him simply faded away, and he heard the voice of Abraham Perelman, talking for the first time directly to his creation, Prism.

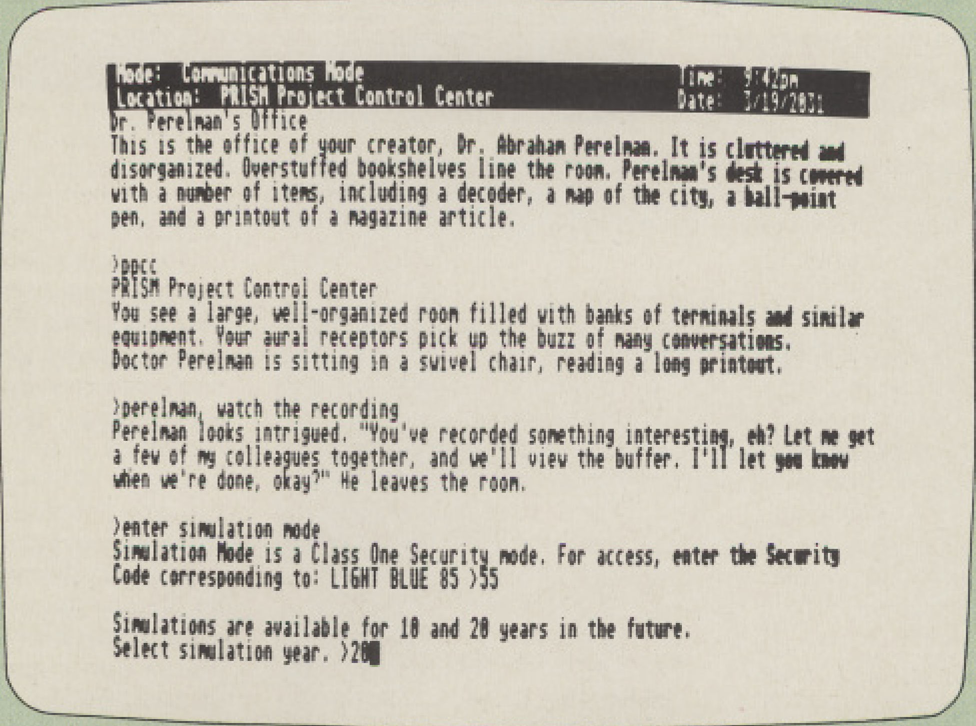
Given this background, you are also informed that the world situation is grim. Crime and urban decay are rampant, and there is extreme overpopulation and poverty.

Senator Richard Ryder has proposed a "Plan for Renewed National Purpose", and the intention is to use Prism to create and study the effects of this plan on a simulation of the world 10 years hence.

If this were an ordinary adventure, you would expect to play Perelman and the computer would follow your orders to gather. information.

However this is no ordinary adventure – this is a state-of-the-art Infocom game, and so you actually play Prism, and must explore for yourself – reporting back to Perelman via the keyboard.

You can contact him, and



other members of the research team, via communications outlets around the establishment (a little like Hal's voice/vision terminals in the film 2001).

You may also communicate with any one of the five simulation control computers and give them new instructions.

You can even tie into a vast library and into the world news network.

I received my instructions from Dr. Perelman, and activated the simulation mode. After entering the relevant colour codes from the code-wheel provided in the package, I was transported from my cosy world of 2031 into a simulation of 10 years hence.

A map of Rockvil circa 2031 is provided, but this doesn't really help you with anything other than major landmarks, as much development has taken place by now, and there is a lot of city to explore.

I took the underground to the other side of the city, being careful to record my journey to play back to Perelman later, and had a meal at a rather expensive restaurant.

Quickly finding out where I lived, I then tracked down my little apartment and visited Jill and our little baby.

Those familiar with Infocom prose will know that the events that take place are vividly described, and take on the same degree of reality that a good novel would as you lose yourself in its pages.

In contrast to many Infocom titles, however, the emphasis is not so much on problem-solving as on the control of the situation you're involved in.

You find out intriguing tit-bits of information about life in the future, meeting and chatting to people as you go.

Still, I soon found that I had completed all the tasks set by Perelman, and I reverted to communication mode to tell him what I'd discovered, and based on my information, the plan was approved.

Perhaps on a standard cassette-based adventure, things would end there, but not with Infocom.

Perelman also told me that the information that I had provided had enabled his team to extend the simulation by a further 10 years.

He seemed rather too busy to give me further detailed instructions, so, being the inquisitive computer I am, I set off to see for myself . . .

And the world has become a shadowy place, full of gloom and suspicion. The secret police raid my house, and terrify Jill.

My brother seems to be in some sort of trouble. The plan has obviously backfired, and it seems to be up to me to find out why, and warn Perelman before it's too late.

Against this nightmare combination of 1984 and Brave New World, the saga continues.

I can thoroughly recommend this adventure to anyone who likes a challenge and wants to get the most from their ST, as it is perhaps the most fascinating concept that Infocom has yet come up with.

Gone are the tricky problems and funny solutions of Steve Meretzky's last game, The Hitch-Hiker's Guide to the Galaxy – an excellent game in its own right – and in their place is a frighteningly realistic view of a future we all hope we can prevent.

I'll let you know how I get on.

André Willey

The golden touch that saves cash

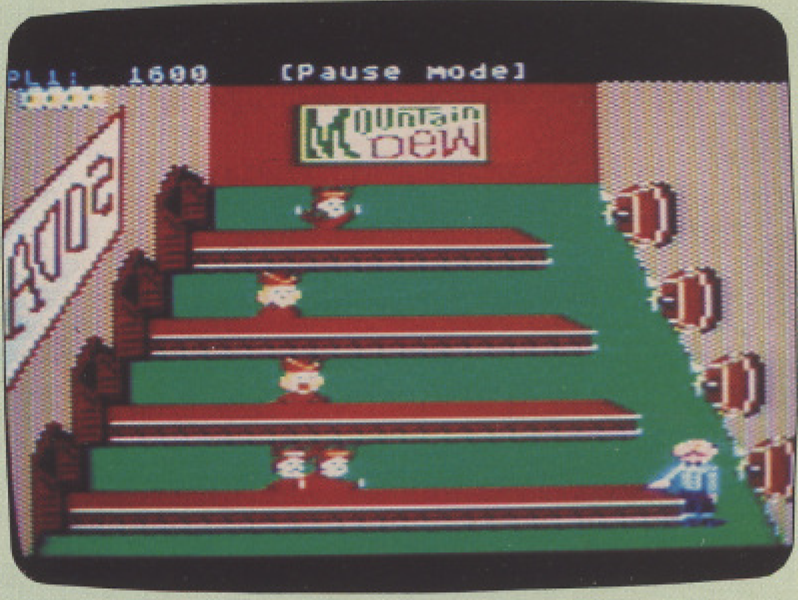
IF you've had your Atari for any length of time and you're at all interested in games, you won't have failed to notice two things. Firstly, a lot of games originate in America. Secondly, they cost a small fortune.

The two points aren't unrelated. It costs money to import software. In the past I've been sent free review copies of software from the States and been charged an arm and a leg in VAT, import duty and Post Office handling charges.

Of course more games get written in America because the Atari market is bigger over there. Not fair, is it?

Fortunately, US Gold is in business to solve this problem. Basically, Gold "buy" a game from America in the form of a licence and sell it over here at less-than-Stateside prices. That way we get American games at British prices.

The latest batch of games to be released by US Gold are **Tapper, Up'n Down, Spy Hunter** and **Zaxxon.**



***Tapper** . . . keeps you going*

Tapper is one of those games which owes its existence to the old stage act of spinning plates on sticks. The idea is that you've got four soda counters to look after. You must slide sodas along to the customers and collect the empties. If you miss an empty glass it crashes to the ground and that's one of your "lives" gone.

The other way you fail is by being over-zealous and sliding a soda when there isn't a thirsty customer – not like any bar I've ever been in!

When you slide a soda the customer retreats and the way to complete a level is to satisfy all customers. On level 1 it's not too difficult.

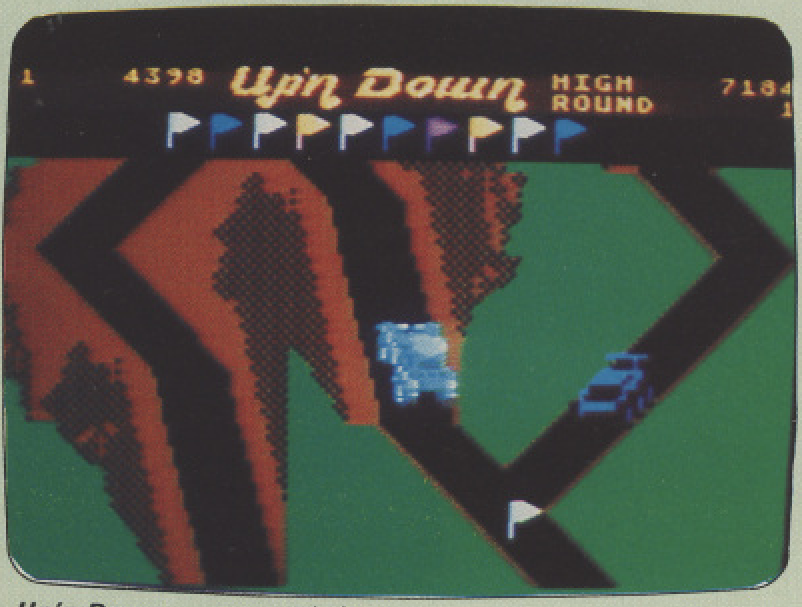
Of course things get harder as you work your way up the levels, with more customers and consequently more empties. There are also bonus rounds when you must watch carefully.

The Soda Bandit shakes five of the six soda cans on the bar and then shuffles them around. You've got to open the unshaken can. Success brings a big bonus, failure brings a faceful of soda.

It's a frantic game which has you leaping about while trying to develop strategies.

It's also slightly unusual for an arcade game in that it's essentially non-violent. The worst that happens is that glasses get broken – no worse than the average home.

Up'n Down is a bit hard to



***Up'n Down**... cans and chaos*

describe. It's a sort of car-driving game, but not in the Pole Position mould.

The road is a narrow latticework that scrolls down the screen and as soon as you press the joystick forward your car starts along the road.

Every so often there are flags and as you pass them they turn white. Completing the "level" involves turning all the flags white. To hinder you there are trucks going in your direction. If you hit them you disintegrate.

There are also wrecks sliding back down the screen, and if they hit you it's curtains.

Because there isn't much of the road system on screen at any one time, you don't get any warning of either the trucks or the wrecks. Also, because the road system isn't very extensive, there's often no way of dodging either trucks or wrecks.

However the car is unusual in that it can jump. Landing on your opponents brings points, but you can also jump from one section of the road to another. You can jump off the road too, but that loses you a life.

Just to keep things moving, the whole game is timed, with different bonuses depending on how fast you complete the level.

It's one of those games which had me saying "silly game – I'll just have one more go!" It's challenging enough to be fun if you like that sort of thing.

Spy Hunter is another driving game, but more in the River Raid genre. You are a world class spy driving for your life. The road is crawling with enemy agents bent on your destruction and they'll stop at nothing, so neither can you.

What this means in practice is another vertically scrolling screen. The game starts with the weapons truck pulling over and your car sliding out of the back, armed with machine guns.

The road branches as you move forward and you've got to be careful to stay on the road. The enemy agents will soon have you crashing off so there's a fair bit of dodging as well as shooting.

Each time you enter a new terrain the weapons truck appears and you can get some more weapons. To do this you must let the truck pass you and then "dock" into the back of it.

It took me a bit of time to get the hand of Spy Hunter – I kept shooting innocent motorists and getting the "No Points" message. Once I got the hang of it, though, it was fun to play.

Finally, Zaxxon is one of the all-time classics. It was one of the first games to give the impression of 3D by using a sort of diagonal scroll. "Height" in the playfield is controlled by forward and backward joystick movement, with lateral movement being controlled correspondingly.

Since you're constantly moving forward, you don't have to worry about the third dimension.

However you do have to worry about the many hazards, both passive and active. On the passive side there are all sorts of things into which you can fly, with the resulting loss of life. On the active side there are missile silos, enemy aircraft and lethal electronic barriers.

The chances are that you've seen Zaxxon in one of the many versions around. If you've ever played it you'll know that it is a great arcade game.

So there you have them. Four games which until recently would have cost considerably more.

Without realising it, I've arranged them roughly in "violence" order, from Tapper with its broken glasses to Zaxxon with its full-scale shoot-'em-up destruction.

If you're an arcade fan, chances are one of them would suit you. As an arcade addict, I've been spoilt for choice.

Pat Cookson

Unlocking hidden graphics talent

THERE was once a time when the average price for Atari software was about £30. Then along came Jack Tramiel. Hardware prices tumbled and in their wake software prices fell.

Nowadays, with most programs costing around £10, anything for less than a fiver is regarded with suspicion.

So it was with some apprehension that I approached **Smart Art**, a graphics picture-drawing utility from P.F. Software that retails at £3.50. Could it really be any good for such a small amount?

Well, Smart Art certainly lacks the sophistication of the Atari Touch Tablet and its accompanying graphics cartridge, but that does cost well over 10 times as much.

Included with the package is a demonstration picture – Mickey Mouse in magician's uniform in a scene reminiscent of Disney's Fantasia – which proves that it is possible with skill and practice to produce high quality graphic pictures with Smart Art.

On loading the program a cursor appears at the centre of the screen and a status display is at the bottom. Using a



***Zaxxon**... ultimate in mayhem*

joystick the cursor can be moved around the 160 × 160 pixel graphics screen and a line or single pixel plotted.

Initially three colours and a background colour – useful for erasing – are available. Any of the three can be changed by selecting from Atari's large palette of colours.

To obtain more the colour registers can be changed part way down the screen and the new colour used for any drawing done below the level of the change.

Up to 80 colours can be displayed on the screen at once.



***Smart Art** . . . fun to use*

Four brush sizes are available that affect the size of plotted pixels and there is an airbrush mode that creates a textured drawing effect.

I would have liked to see more brush modes incorporated to provide varied types of textured and shading effects.

As we all know, Atari Basic is lacking in all but the most elementary graphics commands. Smart Art includes some useful extra commands – circle, fill and box.

Box, as the name implies, draws rectangles. There are three brush speeds. The cursor can whip along at fast speed or slow down to enable more detailed work to be carried out.

Once you have drawn your multi-coloured masterpiece the picture can be saved to tape and loaded again at another time. There is also a separate program to load a saved picture.

In the Smart Art instructions there is no explanation of how to incorporate a picture into your own programs.

As the load program is short, written in Basic and easily listed, it should be possible to use this as the basis of a subroutine in your own program.

Then you could have your alien planet landscape as a background over which star fighters fly at great speed.

Smart Art is fun to use and for the price is certainly no rip-off.

There may be better programs on the market to aid Atari artists, but this one does unlock a lot of the Atari's hidden graphics potential denied to the Basic programmer with no knowledge of machine code.

Smart Art runs on any Atari home computer 16k and above. It is only available by mail order.

Stephen Williamson

Solving the secret of the black box

AS I promised last month, we've more FOR . . . NEXT loops this time, so if you're not too sure of them perhaps you'd better find a few minutes for a bit of quick revision.

Actually Program I should be fairly straightforward. All it does is to print out

A BLACK BOX

three times. The loop variable COUNTER keeps track of how many times lines 50 to 80 – the body of the loop, between the FOR and NEXT – are repeated. Since line 30 reads:

```
30 FOR COUNTER=1 TO 3
```

this will be three times. Notice that lines 50 and 60 have semi-colons to "glue" the words together. Line 70 omits this, though, as we want to move on to a new line.

```
10 REM PROGRAM I
20 PRINT CHR$(125)
30 FOR COUNTER=1 TO 3
50 PRINT "A";
60 PRINT " BLACK";
70 PRINT " BOX"
80 PRINT
90 NEXT COUNTER
```

Program I

So why the message "A black box"? Well, the idea is to stress that it doesn't really matter what's inside the "box" formed by the FOR and NEXT, it will be done as many times as is specified in the FOR Statement.

Admittedly our knowledge of Basic isn't yet so encyclopaedic that we could think of many other things to go inside the box, but we can see the possibility.

The point is, given lines 30 and 90, whatever lies in the box between them will be done three times and you don't have to know what's inside the box to be aware of this. There are stupid exceptions to this which we'll meet, but they involve bad programming, which, of course, you won't be interested in . . .

Part VIII of MIKE BIBBY's guide through the micro jungle considers the question of nested loops

```
10 REM PROGRAM II
20 PRINT CHR$(125)
50 FOR LOOP=1 TO 4
60 PRINT "DOING LOOP"
70 NEXT LOOP
```

Program II

Now take a look at Program II. Again, a simple loop. Nothing there to trouble you – it just prints out:

DOING LOOP

four times. Lines 50 to 70 form the chunk of program that prints this message out four times.

The only odd thing about this program – and Program I, come to that – is that our line numbers haven't gone up in consecutive tens. You'll see why in a minute.

Returning to Program I, as I've stressed it doesn't matter what went inside the loop formed by lines 30 and 90 – it would be done three times.

So in a wheels within wheels manner, let's put a loop inside the loop of Program I. We'll take the loop of Program II – lines 50 to 70 – and put them in place of the lines that give the "A Black Box" message in Program I – also lines 50 to 70 (now you see one of the reasons for the line numbers).

```
10 REM PROGRAM III
20 PRINT CHR$(125)
30 FOR COUNTER=1 TO 3
50 FOR LOOP=1 TO 4
60 PRINT "DOING LOOP"
70 NEXT LOOP
80 PRINT
90 NEXT COUNTER
```

Program III

Program III is the result. We now have two loops, one nested inside the other like those Russian dolls. In fact we call them nested loops. And you won't be surprised to learn that we

→

'Wheels within wheels . . . loops within loops'



call the loop that goes round the outside the outer loop, and the one on the inside the inner loop.

Before you run it, see if you can think through what happens. Lines 30 to 90 ensure that we do the intermediate lines three times. Of these lines, 50 to 70 form a loop printing out "Doing loop" four times, followed by a blank line (line 80).

So the outcome is that we get the message "Doing loop" 12 times in all, in three sets of four, each separated by a blank line.

To help you see what's going on more clearly, Program IV gives another version. I've changed the loop variable in lines 30 and 90 to *SET* to reflect the fact we're doing things in sets, and added:

```
40 PRINT "SET ";SET
```

to mark off each set. Note this line is inside the outer loop but outside the inner loop, so it only appears each time the outer loop is done. I've also altered line 60 so that the variable *LOOP* is printed out as it cycles through its various values.

To get a feel for nested loops, try changing the limits of the loops in lines 30 and 50, predicting what you'll get *before* you run the altered program.

After your experiments restore the original Program IV, swap lines 70 and 90, then RUN the result. You should be able to work out what's going wrong. Remember, they're nested loops – the start and finish of the inner loop must fit neatly inside the start and finish of the outer.

Anyway, untangle yourself from this mess by swapping the lines back and change line 50 to:

```
50 FOR LOOP = 1 TO SET
```

then run it. You should get:

DOING LOOP 1

DOING LOOP 1
DOING LOOP 2

DOING LOOP 1
DOING LOOP 2
DOING LOOP 3

We're still doing the outer loop three times, so we still get three sets of output from the inner loop. Now though, because of the change to line 50, the number of times the inner loop is done varies, depending on the value of *SET*. That is, the number of

'The start and finish of the inner loop must fit neatly inside the start and finish of the outer'



```
10 REM PROGRAM IV
20 PRINT CHR$(125)
30 FOR SET=1 TO 3
40 PRINT "SET ";SET
50 FOR LOOP=1 TO 4
60 PRINT "DOING LOOP ";LOOP
70 NEXT LOOP
80 PRINT
90 NEXT SET
```

Program IV

times the inner loop's done depends on the value of the outer loop's variable!

In this case the longer in the tooth the outer loop is the more often the inner loop is done. The effect is that there's one more "Doing loop" in each successive set.

(As we've already seen, we refer to the loops as outer and inner. Some people like to use these words as labels for their loops to help them keep track. Program V reinterprets Program IV in this way. Personally, I prefer more meaningful labels – it's up to you.)

Program VI uses the idea of making the number of times we do the inner loop dependent on the outer loops variable to print out a triangle of asterisks.

When deciphering what's going on with nested loops it's helpful to have a quick look at the line defining the outer loop – in this case line 30 – to get an idea of the range of its variable. Then concentrate on the inner loop – here lines 40 to 60.

The effect of this inner loop is to print out *LENGTH* number of asterisks on a line: Our inner loop goes from one to *LENGTH* and a semicolon follows the asterisk in the PRINT Statement of line 50, which forms the body of the loop. After printing the required number of asterisks, line 70 moves us on to the next line of the display.

So looked at as a black box, what's inside the outer loop (lines 40 to 70) simply prints out a separate line of *LENGTH* asterisks.

We repeat this outer loop 10 times, with the value of *LENGTH* varying from one to ten. So the first time round the outer loop we get one asterisk on a line, the second time two asterisks, and so on.

I use a similar technique in Program VII to produce a triangle of letters. Here the outer loop variable, *FINISH*, ranges from one to LEN-*(STRING$)*. Since *STRING$* is ABCDEFGHIJ, this boils down to our familiar from one to ten.

I've chosen *FINISH* as a label because its value determines where

```
10 REM PROGRAM V
20 PRINT CHR$(125)
30 FOR OUTER=1 TO 3
40 PRINT "SET";OUTER
50 FOR INNER=1 TO 4
60 PRINT "DOING LOOP ";INNER
70 NEXT INNER
80 PRINT
90 NEXT OUTER
```

Program V

```
10 REM PROGRAM VI
20 PRINT CHR$(125)
30 FOR LENGTH=1 TO 10
40 FOR ASTERISK=1 TO LENGTH
50 PRINT "*";
60 NEXT ASTERISK
70 PRINT
80 NEXT LENGTH
```

Program VI

```
10 REM PROGRAM VII
20 PRINT CHR$(125)
30 DIM STRING$(10)
40 STRING$="ABCDEFGHIJ"
50 FOR FINISH=1 TO LEN(STRING$)
60 FOR LETTER=1 TO FINISH
70 PRINT STRING$(LETTER,LETTER);
80 NEXT LETTER
90 PRINT
100 NEXT FINISH
```

Program VII

we end our printing of characters from *STRING$* in the inner loop.

The inner loop prints out successive characters from *STRING$* by picking them out with:

```
70 PRINT STRING$(LETTER,LETTER);
```

as *LETTER* varies from one to *LENGTH.* Remember: *STRING$(1,1)* picks up the first letter of *STRING$, STRING$(2,2)* the second, and so on.

The semicolon of line 70 ensures they all appear on the same line. Once the inner loop is complete and the line finished, line 90 moves to a fresh line of the display.

The outer loop is then repeated, *FINISH* being increased by one, so that this time our inner loop will print out one extra character from *STRING$* and so on.

Actually we could accomplish all this with far less effort, as we saw from Program IV last month. However it illustrates the techniques of nested loops quite well.

Now take a look at Program VIII. Before you start looking, it hasn't got nested loops – that will come later! The idea of the program is to add together all the whole numbers (integers) between one and a number you've input, then print out the result.

For instance, if you input 5, the program would do the sum 1+2+3+4+5 and print out the answer, 15.

```
10 REM PROGRAM VIII
20 PRINT CHR$(125)
30 PRINT "Number ";
40 INPUT NUMBER
50 PRINT
60 TOTAL=0
70 FOR INTEGER=1 TO NUMBER
80 TOTAL=TOTAL+INTEGER
90 NEXT INTEGER
100 PRINT "Total is ";TOTAL
```

Program VIII

As you can see, the numbers we add go up in steps of one, so it's a natural for a loop.

The number we're going to total up to is called *NUMBER.* Lines 30 and 40 get its value for us. Our answer is going to be stored in the appropriately named *TOTAL* which we set to zero with line 60.

For a moment, think about how you do a sum like 1+2+3+4. The answer doesn't just leap into your head all at once. You do it by adding two of the numbers, then adding the answer to the next number, then adding that new answer to the next number and so on.

In other words you think "One and two gives me three. Three and three give me six. Six and four give me ten. No more to add, that's the answer". We call it keeping a running total. This is how the micro does it, adding each new number to the answer arrived at so far.

To see how Program VIII works, assume you've input 4, so we're asking the micro to do the sum we've just worked through. The actual work of adding is done in line 80, the body of the loop. This adds the integer we're considering to the total so far.

INTEGER goes from 1 to 4 successively. Since *TOTAL* is initially zero, the first time through the loop line 80 boils down to TOTAL = 0 + 1, so our total so far is one – correct.

We don't actually do this first 0+1 step when we do it in our heads, but the micro is a very formal beast.

Next time through the loop, *INTEGER* is 2, and the current value of *TOTAL* is one so, TOTAL=TOTAL+INTEGER, which boils down to TOTAL=1+2 and *TOTAL* assumes the new value three.

Next time through, *INTEGER* is three, so line 80 becomes in effect TOTAL=3+3 and *TOTAL* adopts the value six.

The next time through – the final in this case – line 80 is equivalent to TOTAL=6+4 and *TOTAL* becomes ten. We then drop through the loop and print the total out with line 100.

Program IX uses exactly the same technique, but this time I wrap the whole thing up in an outer loop that "does the input" for me, giving

```
10 REM PROGRAM IX
20 PRINT CHR$(125)
30 FOR RANGE=1 TO 10
40 TOTAL=0
50 FOR INTEGER=1 TO RANGE
60 PRINT INTEGER;"+";
70 TOTAL=TOTAL+INTEGER
80 NEXT INTEGER
90 PRINT CHR$(30);"=";TOTAL
100 NEXT RANGE
```

Program IX

endpoints for the ranges I'm totalling over from one to ten (lines 30,100). In other words I get all the totals for:

1
1+2
1+2+3

and so on.

I've also gone to some trouble to improve the appearance of the output. Just before I add *INTEGER* to the running total (line 70) I print it out, together with an accompanying + sign (line 60). Thus the effect of the inner loop is that not only do we calculate *TOTAL,* but all the integers being summed appear on the same line with + signs between them.

When we drop out of the inner loop we then print out the answer. However, we need to do a bit of tidying up first. You see, each integer is followed by a +, from line 60. After the last integer though, we don't want a +, we want =.

Well, once the cursor has printed the final + it moves on to the next space on that line of the screen (the effect of the semi-colon). All we do is to move the cursor back with the magical CHR$(30), overprint our + with an = and print *TOTAL.* Line 90 shows how it's done.

Then, of course, line 100 loops us back if we haven't done all our totals.

A final point. Before each repetition of the inner loop, in other words before we do each running total, we set *TOTAL* to zero. It's vital we set it back to scratch this way each time, otherwise we'll be adding in the previous running total to our current one. Try leaving line 40 out and running the program if you don't see what I mean.

● *That's enough for this month. Next we'll have a look at more of the fundamentals of Basic – and you can be sure loops play a vital part.*

Ten winners for my stockings

'SEASONS greetings to all you adventurers out there! This being the time of year when you may be contemplating either the purchase or receipt of some software here's my own Atari Top Ten for Christmas.

By Brillig

1 *The Hitch Hiker's Guide to the Galaxy,* *Infocom (disc only £29.95).*

As I've said before, and will keep saying until you all have them, if you do not own a disc drive then the purchase of an Infocom adventure should be the reason for going out and getting one immediately.

This is, quite simply, the best of the recent Infocom releases, being both a well crafted adventure, and, by and large, faithful to the book – at least at the beginning – as well as depicting the characters exactly as Douglas Adams created them.

Absolutely the best adventure released this year – bar none.

2 *Adventureland,* *Adventure International (cassette or disc with graphics £15.95).*

The original micro adventure from Scott Adams and still the best introductory one about. It probably won't keep you taxed that long, but by the time you finish it you'll be hooked, and that is the whole idea.

3 *The Pay-Off,* *Atari/Bignose Software (£9.95 disc from Atari, £5.95 cassette from Bignose).*

This freebie adventure from the Atari disc pack – and they tell me the new packs should include notches – is also available over the counter.

A bit tricky for a pure starter adventure, as there are not too many clues around at the start, but as you start to get into character the problems come thick and fast.

Now available in cassette format from the original authors, under licence, for non-driving adventurers.

4 *Colossal Adventure,* *Level 9 (£9.95 cassette).*

This is another for those of you without drives, the best cassette implementation of the original Crowther/Woods mainframe adventure, completę with the bird and snake, mazes galore and with an extra 70 location endgame as a bonus to boot.

5 *Zork I,* *Infocom (£29.95 on disc).*

If you do have a drive and have a yen to go exploring underground, then the Zork trilogy, of which this is the first and best, is number one for you.

Level 9 provides an accessible alternative but if you want to adventure with a drive then why settle for less. Fascinating problems and good interaction with the characters you will meet on your journey add to the fun.

6 *The Count,* *Adventure International (as Adventureland).*

This game has a very special meaning for me as it is the first I ever completed. A typical early Adams effort with a little more lateral thinking required than Adventureland.

Say what you like, but the Scott Adams adventure series has a neat progression about it. You get the impression that he was learning as he wrote them, and so beginners are well advised to follow them in sequence.

This one has a beautiful twist in the solution as well as some truly awful jokes. If you found some adventures a bit tough, or Adventureland a bit easy, then this is the one for you.

7 *Lords of Time,* *Level 9 (£9.95 cassette).*

Written by Sue Gazzard and programmed by the Austins, this game gives an authentic feel to each of the nine time zones portrayed. There is more meat in the plot than in some of the other Level 9 offerings, and I found the game thoroughly enjoyable. More for the experienced adventurer than the novice.

8 *Savage Island,* *Adventure International (as AI other games).*

Savage it certainly is, as this is a real toughie for Scott Adams fans, and all you get at the end of it is the password for Savage Island II – reward in itself for any adventurer worth his salt.

9 *Mask of the Sun,* *Broderbund (£43.95 on disc).*

At last a graphic adventure, I hear you say. Well this is a *personal* top ten and my predeliction is for the purity of text and imagination than pictures.

Graphics strike me as being the



lazy adventurer's way of getting into character, and in all honesty you shouldn't need them. If graphics are your bag though, this is a fairly atmospheric adventure, although there is a bit too much driving along roads for me to go overboard.

But once you get into the tombs it is really rather good.

10 ***Emerald Isle,*** *Level 9 (in budget mode at £6.95 on cassette).*

The last of the non-graphic Level 9 efforts, and as a big sprawling game it actually works, with a neatly constructed plot, a good dose of humour and plenty of problems to solve.

★ ★ ★

So that is what Brillig is slipping into various Christmas stockings this year. Next year promises to be an exciting one, with the ST perhaps helping to break the mould of Atari adventuring.

Certainly the Infocom range is there already, and Talent is converting the QL adventures West and Zkul. It would be good to see some more new faces on the adventure scene to break the Scott Adams/Infocom/Level 9 stranglehold.

To that end Bignose Software is releasing Opera House, a ghostly tale about a theatre terrorised by the Phantom. You play the hero in a complex quest to save your career, plucked from chorus line obscurity, before it has even begun. Available on disc at £9.95 and cassette at £5.95 it looks a worthy follow up to The Pay-Off.

★ ★ ★

This month's glitch was spotted by Geoffrey McHugh in Level 9's Adventure Quest. In the Orc's tower on the mountain there is a rope. Now where there is a rope there is somewhere to tie it. Say "Tie Rope" and guess what you will find hanging from the stalactite when you get to the Abominable Snowman's cave?

Mark Williams has the problem in Hulk, from Adventure International, of ending up dead whenever he finds himself in close proximity to the Natter Energy Egg. The Hulk can go to work on an egg if he takes his doctor's advice. It is not the Nightmare problem you think, Mark!

Merry Christmas and an Adventurous New Year to you all!



BRILLIG'S New Year Resolution is to try to be a bit more tolerant of graphics in adventures. Here are a few resolutions I'd like to see from some of our illustrious adventure writing friends:

Level 9: *More story, less padding and a sensible error message. "Wirts Mirts Bud" cannot be seen as an intelligent advance on "Arfle Barfle Gloop".*

Infocom: *Follow up Hitch Hiker's and don't put graphics in any game they ever release.*

Adventure International: *Actually to release Questprobe III – The Fantastic Four, and to make it a gem of an adventure rather than an adventure of gems.*

Brian Howarth: *To find a compass in one of his Christmas crackers, and use it in his next adventure.*

MicroLink
in association with
TELECOM GOLD

No. 4 December 1985

NEWSLETTER

Special interests groups

MANY MicroLink subscribers have been in touch to say they want to organise closed user groups within the system to promote their special interests.

Systems manager Colin Rogerson says MicroLink is only too happy to help out where possible and invites interested parties to phone him on 061-429 0788 for details.

In order to assess the depth of interest in specific CUGs, he suggests that anyone proposing to form a group should advertise the fact in the Contacts or Communications sections of the MemoPad facility.

"We have messages on the MemoPad now from people who want to form closed user groups for Commodore, QL, Atari, 68000 machines, and Telecom Gold enthusiasts", says Rogerson.

"The response to them will indicate the demand for such facilities and help us in planning to provide them".

Now Who's Who goes electronic

A WORLD first in electronic publishing, the Who's Who of the microcomputing scene in Britain, is now being made available on MicroLink.

It has been such a success since it was launched on DealerLink, our sister service, that it is seen as a logical move to extend it to MicroLink.

Constantly updated by our team of researchers, it contains comprehensive details of all the top personalities in the world of microcomputing. And they have dug up some little-known facts to help make the electronic pen portraits come alive.

For instance, the Who's Who reveals that one headline maker has the middle names of Marles, once worked as a reporter on Practical Wireless and unwinds by reading poetry. He is none other than Sir Clive Sinclair.

YOUR chance to join MicroLink – turn to Page 18

Oman connection

WHAT is helping to make MicroLink the fastest growing international electronic communications system is the remarkable way its fame is spreading around the world.

From the Sultanate of Oman, chartered engineer S.R.G. Rajan wrote to say how he had heard all sorts of good things about MicroLink and could he please become a subscriber. Rajan, general manager of the Oman Industrial Gas Company, is the latest of many subscribers in the Middle East.

Many yen for MicroLink...

ONE of the growing number of Japanese users of MicroLink, journalist Yuichi Ishikawa of 4 x 4 magazine, mailboxed from Tokyo to say how it has been saving him a lot of Yen lately.

This is because he discovered that it is cheaper to send a telex to his contacts in Japan via MicroLink than it is to use the Japanese telex service. It means his messages have to travel from Tokyo to the MicroLink computer in London and then back to Tokyo!

Yet there is no appreciable delay in getting his message through – an essential requirement for a busy journalist battling against deadlines.

With the aid of Yuichi, MicroLink has even penetrated the bamboo curtain. He has regular telex correspondence with a contact in the Chinese capital Peking using MicroLink.

However Yuichi's active use of MicroLink is likely to be dwarfed by one of his neighbours – one of Japan's leading financial institutions, the Bank of Toyko, recently became a subscriber.

Get it right!

EVER since we asked for readers' opinions on the subject of check-sum programs we have had a steady stream of letters. Almost without exception these have been suggesting that we use such a program in conjunction with our listings in order to assist in debugging.

By **RICHARD VANNER**

In response to this demand I have written Get It Right! The idea is that you use this utility to produce a list of numbers from your program. You then compare these numbers with the list we'll print at the end of each program in the magazine.

If the check-sums differ for any lines then they are the lines where you've entered something slightly differently.

Of course a different REM line shouldn't affect the running of the program. If program lines are at fault it should be a simple task to edit or re-enter the lines and repeat the process until your check-sums agree with the printed ones.

Once you have typed in the program you wish to check, save it to disc or cassette so you've got a secure copy in case anything goes wrong.

Now make a list copy of the program using LIST"C:" (for cassette users) or LIST"D:filename" (for disc users). It is this version of the program that will be used.

Load Get It Right! and position the tape at the start of the program to be checked – or make sure the correct disc is in the drive. Now run it and the file will start loading.

Note that Get It Right! assumes the listed program file is called TEST, but you can easily alter this by changing line 1000. Cassette users will find their version of line 1000 in the REM statement in line 999.

Get It Right! will take each program line, calculate the check-sum, and print it to the screen. If it's a short program the whole check-sum table will fit on the screen. However for larger ones use Control-1 to stop the table scrolling off the screen until you've compared your values with the printed values.

All that remains is for you to type in Get It Right! and you should have no more debugging problems. We've even printed the check-sums for the program itself . . . er, isn't there a logical problem there somewhere?

Oh well, just make sure you Get It Right!

```
10 REM ┌────────────────────────────┐
20 REM |       GET IT RIGHT !       |
30 REM |----------------------------|
40 REM | Written by Richard Vanner  |
45 REM |    (C) ATARI USER  1985    |
50 REM └────────────────────────────┘
60 DIM HEAD$(100),LINE$(130),LN$(6),SL
N$(10),SCH$(10),SIZE(5)
65 TRAN=1:FLAG=0
70 GRAPHICS 0:SETCOLOR 2,0,0:SETCOLOR
1,0,10:POKE 752,1
75 GOTO 5000:REM MAIN MENU
80 GOSUB 1000:REM OPEN FILE
81 POKE 82,0:? :START=0:TRAN=1:FLAG=0
82 LN$=" ":LN$(6)=" ":LN$(2)=LN$
83 SLN$=" ":SLN$(10)=" ":SLN$(2)=SLN$
84 SCH$=" ":SCH$(10)=" ":SCH$(2)=SCH$
85 HEAD$=" ":HEAD$(10)=" ":HEAD$(100)=
HEAD$
95 GOSUB 1040:REM PUT HEADER
100 GOSUB 4000:REM GET LINE NUMBER
105 IF FLAG=1 THEN GOTO 4600
110 GOSUB 4070:REM GET LINE
130 GOSUB 4200:REM TOTAL LINE UP
140 GOSUB 4300:REM FORMAT LN No
145 GOSUB 4400:REM FORMAT CHSUM
150 GOSUB 4500:GOTO 100
999 REM  CASSETTE  USERS CHANGE 
         LINE 1000 TO    :-      
         OPEN #1,4,0,"C:"        
1000 OPEN #1,4,0,"D:TEST"
1010 RETURN
1040 REM
1050 HEAD$=" LINE CHSUM  LINE CHSUM 
 LINE CHSUM ":? HEAD$
1060 HEAD$="┌─────────┬─────────┬────
────────┐ ":? HEAD$
1070 RETURN
4000 REM  GET A LINE 
4005 C=1:TRAP 4100
4010 GET #1,DAT
4020 IF DAT=32 THEN GOTO 4050
4030 LN$(C,C)=CHR$(DAT):C=C+1:GOTO 401
0
4050 LE=C-1:RETURN
4060 REM  CHECK SUM ROUTINE 
4070 LINE$=" ":LINE$(1,1)=CHR$(32):C=2
4080 GET #1,DAT:IF DAT=155 THEN LE2=C-
1:RETURN
4090 LINE$(C,C)=CHR$(DAT):C=C+1:GOTO 4
080
4100 FLAG=1:RETURN :REM END OF FILE
4200 REM  TOTAL UP LINE 
4210 CHSUM=0:TRAN=0
4240 FOR A=1 TO LE2
4250 CHSUM=CHSUM+ASC(LINE$(A,A))+TRAN:
TRAN=TRAN+1:IF TRAN>5 THEN TRAN=1
4260 NEXT A
4270 RETURN
4300 REM  FORMAT LINE NUM 
4310 SLN$="     ":L=VAL(LN$):SIZE=LEN(
STR$(L))
4312 SLN$(6-SIZE)=STR$(L):RETURN
4360 ? "K Data Corrupt !!!K":END
4400 REM  FORMAT CHSUM 
4410 SCH$="     ":SIZE=LEN(STR$(CHSUM)
)
4420 SCH$(6-SIZE)=STR$(CHSUM):RETURN
4470 ? "K Data Corrupt !!!K":END
4500 REM
4510 REM  PRINT RESULT TO SCREEN 
4512 IF START=0 THEN CC=1:X=2:START=1:
HEAD$=" ":HEAD$=" ":HEAD$(38)=" ":HEAD
```

→

```
$(2)=HEAD$:GOTO 4540
4530 X=X+12:IF X=38 THEN X=2:Y=Y+1:? H
EAD$:HEAD$=" ":HEAD$(38)=" ":HEAD$(2)=
HEAD$
4535 IF FIN=1 THEN ? HEAD$:RETURN
4540 HEAD$(X,38)=SLN$:HEAD$(X+5,38)="
":HEAD$(X+6,38)=SCH$:GOSUB 4710
4550 RETURN
4600 IF X<>26 THEN FIN=1:GOSUB 4500
4605 IF X=26 AND FIN=0 THEN ? HEAD$
4610 HEAD$="└───────────┴───────────┴──
──────────┘ ":? HEAD$:POKE 82,2
4620 SETCOLOR 2,14,10:SETCOLOR 1,0,2:P
OKE 752,0:? "K               IT'S DONE"
4630 CLOSE #1:GOSUB 6100:POP :RUN
4700 REM  HEADS DEFAULT 
4710 HEAD$(1,1)="|":HEAD$(13,13)="|":H
EAD$(25,25)="|":HEAD$(37,37)="|":RETUR
N
5000 REM  MAIN MENU 
5010 POKE 82,2:? "K":POKE 752,1:SETCOL
OR 2,0,0:SETCOLOR 1,0,10
5020 ? "GET IT RIGHT! ATARI USER'S CHE
CK SUM."
5030 ? "──────────────────────────────
───────"
5040 ? :? "        1  CREATE CHECKSUM D
ATA."
5060 ? :? :? "        2  EXIT TO BASIC.
"
5080 POSITION 10,22:? "By Richard Vann
er."
5090 OPEN #1,4,0,"K:"
5100 GET #1,KEY
5110 KEY=KEY-48
5120 IF KEY<1 OR KEY>2 THEN GOTO 5100
5125 CLOSE #1
5130 ? "K":ON KEY GOSUB 80,6000
5140 GOTO 5000
6000 POKE 752,0:SETCOLOR 2,3,0:END
6100 REM  PRESS A KEY 
6110 OPEN #1,4,0,"K:":? "      PRESS AN
Y KEY TO CONTINUE"
6120 GET #1,DAT:CLOSE #1:RETURN
```

Tired of typing?

Take advantage of our finger-saving offer on Page 69.

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	923	20	1985	30	1905
40	3124	45	2080	50	930
60	3435	65	940	70	3439
75	1596	80	1660	81	2314
82	1647	83	2037	84	1977
85	2296	95	1745	100	2094
105	1588	110	1591	130	1962
140	1910	145	1920	150	1257
999	14549	1000	1261	1010	565
1040	307	1050	8220	1060	1793
1070	565	4000	2589	4005	847
4010	664	4020	1574	4030	2147
4050	1014	4060	4067	4070	1974
4080	2779	4090	2299	4100	2119
4200	3249	4210	1046	4240	937
4250	4609	4260	466	4270	565
4300	3652	4310	2590	4312	1958
4360	4463	4400	3076	4410	2172
4420	2262	4470	4463	4500	307
4510	5096	4512	5674	4530	4662
4535	1970	4540	3918	4550	565
4600	1985	4605	1928	4610	2425
4620	4346	4630	1949	4700	3195
4710	4464	5000	2444	5010	3662
5020	2757	5030	799	5040	2351
5060	2013	5080	2882	5090	935
5100	680	5110	743	5120	2125
5125	547	5130	1672	5140	604
6000	1959	6100	2830	6110	3187
6120	1832				

Dave Russell concludes his series on Atari graphics with a look at the rest of the modes you access from Basic



IN this, the last article in the series, I'd like to take a brief look at the remaining modes which XL and XE owners can access from Basic – 12, 13, 14 and 15.

Early Atari 400 and 800 models were capable of displaying these modes, but they required the building of a custom display list. Since that's a topic better suited to Mike Rowe's series, I'll confine myself to using the modes from Basic.

Modes 12 and 13 are very similar in behaviour and only really differ from each other in pixel size. Both are split screen modes, with Mode 12 having 40 columns × 20 rows and Mode 13 having 40 columns × 10 rows. Both have a four-line Mode 0 text window.

If you type GRAPHICS 12 and press Return you'll be presented with a largely black screen. The familiar blue text window and the Ready prompt should be at the bottom.

In many books on the Atari's graphics you'll read that text is difficult to display in Modes 12 and 13. You can demonstrate this to yourself by typing PRINT #6;"ATARI USER" and pressing Return.

With a knowledge of what it's supposed to say on the screen, you might be able to decipher it. No prizes for legibility though. For this reason books that don't say these modes are difficult usually choose to ignore them completely. It makes you wonder why some books list them as text modes, doesn't it?

Now, thanks to G. Thornton of Hordle, in Hampshire, we're able to bring you a method of putting legible text on a Mode 12 or Mode 13 screen.

Type in Program I and run it. Voila! Instant Mode 12 text without redefining characters.

I've adapted Mr Thornton's original listing in order to encourage experimentation. With each of the SETCOLOR commands on a separate line it's easy to REMove them either individually or in combination and observe the effect.

```
10 GRAPHICS 12
20 SETCOLOR 0,12,7
30 SETCOLOR 1,0,0
40 SETCOLOR 2,0,0
50 SETCOLOR 3,12,7
60 SETCOLOR 4,0,0
70 PRINT #6;"THIS IS NORMAL TEXT"
80 PRINT #6;"this is lower case text"
90 PRINT #6;"THIS IS INVERSE UPPER CAS
E TEXT"
100 PRINT #6;"this is inverse lower ca
se text"
```

Program I

Just use the cursor and control keys to move up to the line, insert four spaces and type REM after the line number. When run the program will ignore the rest of the line.

To restore the line use the cursor and control keys to delete the REM. This method allows you to insert and delete lines repeatedly without having to re-type them.

Modes 14 and 15 both have the same resolution of 160 columns × 160 rows and both have a four line text window. Mode 14 allows two colours and Mode 15 allows four.

This makes Mode 15 useful because it has reasonable resolution and four colours while requiring the same amount of memory as Mode 8.

As with previous map modes we've considered, the COLOR command selects the colour to be used and SETCOLOR can be used to alter the contents of the colour registers.

In fact you can think of Mode 14 as Mode 6 but with 160 × 160 instead of 160 × 80 resolution, and Mode 15



Graphics mode	Mode type	No. of columns	No. of rows		No. of colours	RAM required (bytes)	
			Split screen	Full screen		Split	Full
0	TEXT	40	–	24	1-1/2	–	992
1	TEXT	20	20	24	5	674	672
2	TEXT	20	10	12	5	424	420
3	GRAPHICS	40	20	24	4	434	432
4	GRAPHICS	80	40	48	2	694	696
5	GRAPHICS	80	40	48	4	1174	1176
6	GRAPHICS	160	80	96	2	2174	2184
7	GRAPHICS	160	80	96	4	4190	4200
8	GRAPHICS	320	160	192	1-1/2	8112	8138
9	GRAPHICS	80	–	192	1	–	8138
10	GRAPHICS	80	–	192	9	–	8138
11	GRAPHICS	80	–	192	16	–	8138
12	GRAPHICS	40	20	24	5	1154	1152
13	GRAPHICS	40	10	12	5	664	660
14	GRAPHICS	160	160	192	2	4270	4296
15	GRAPHICS	160	160	192	4	8112	8138

Modes and screen format

as Mode 7 with the same increase in resolution.

I had intended to write a brief resumé of all we'd covered in this series. However my natural laziness led me to write Program II instead.

It's a "Russell Special" – in other words, not quite finished. What I've done is to provide a simple demo for graphics Modes 3 to 8.

The program waits for you to select a mode and then reads the screen dimensions from the appropriate data statement. It then draws the pattern in the appropriate mode.

It will carry on drawing it until you either hold the Start key down or press Break or Reset.

As I said, I've done the easy bit and stopped at Mode 8. If you want to improve the program I suggest you extend it to include Modes 9 to 15, assuming that your machine is capable of displaying them.

You'll probably need to revise what we've said about the colour registers, but maybe you could incorporate choice of registers in the data statements along with the screen size.

One non-graphics problem which you'll have to overcome results from my use of the GET statement. Line 50 opens the keyboard as a device and line 60 returns the Atascii code for the key pressed.

The trouble is GET only takes a single key-press so you can't use it to enter say 15 as a choice of mode. Of course there's more than one way to read input, isn't there?

I'd recommend that you experiment with all the programs I've listed in the series. That way you'll reach a better understanding of what you can do with each mode and therefore be able to choose the best one for each job.

With a bit of luck you might discover an unusual effect, just as Mr Thornton did. If you *do* make a discovery, don't forget the guys in the *Atari User* office – they'd love to hear from you.

```
10 GRAPHICS 2+16
20 POSITION 3,5:PRINT #6;"CHOOSE A MOD
E"
30 PRINT #6;"HOLD start TO RESET"
40 PRINT #6;"PRESS break TO END"
50 OPEN #1,4,0,"K:"
60 GET #1,X
70 CLOSE #1
80 MODE=X-48:IF MODE<3 OR MODE>8 THEN
50
90 RESTORE 400+MODE
100 READ HORIZ,VERT
110 GRAPHICS MODE+16
200 COLOR 1
210 POKE 708,RND(0)*255
215 GOSUB 300
220 IF PEEK(53279)<>7 THEN RUN
225 COLOR 2
230 POKE 709,RND(0)*255
235 GOSUB 300
240 IF PEEK(53279)<>7 THEN RUN
250 POKE 77,0
260 GOTO 200
300 FOR I=VERT TO 0 STEP -3
310 J=VERT-I
320 PLOT 0,I
330 DRAWTO HORIZ,J
340 NEXT I
360 FOR I=0 TO HORIZ STEP 3
370 J=HORIZ-I
380 PLOT I,0
390 DRAWTO J,VERT
395 NEXT I:RETURN
403 DATA 39,23
404 DATA 79,47
405 DATA 79,47
406 DATA 159,95
407 DATA 159,95
408 DATA 319,191
```

Program II

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COMPUTER COUNTDOWN

THIS game is based on the well-known television game Countdown on Channel 4, which has nine rounds of three different kinds.

First comes the word game, in which you pick nine letters, either C (consonant) or V (vowel), which are then chosen at random by the computer.

The computer will pick the more commonly used letters in preference and each time a letter is used it reduces the chances of it occurring again.

After all nine letters are picked the computer will start a 30 second countdown during which time you must find the longest word you can make from those nine letters. Each letter can be used only once.

At the end of the 30 seconds the computer will ask for the length of your word. It will then ask for your word.

You have only a limited time to answer and if you delay too long the computer will show its annoyance with a tone and tell you that your taking too long. You must quickly press a key.

After having typed in your word and pressed Return, the computer will check the word for validity of length and letters used.

It cannot check if the word is a real word – but you wouldn't cheat, would you?

Next comes the numbers game. Here you will be asked for the number of high numbers you want. Try two initially. It will then choose, at random, six numbers, four of which will be between 1 and 10. The two high numbers will be 25, 50, 75 or 100.

The computer will then generate a random number between 100 and 1,000 as a target number. As you might guess, the object is to get as near to this number as you can using each number only once and the four functions + – * /.

Again a countdown will be presented. After it the program will ask for your number and you again have a limited time to enter it.

If your number is within 10 of the target number the computer will want to check it. This is done calculator style using the numbers, the above four functions, and equals.

Any other key, including Return will erase that line. As well as the six numbers given originally you can use the numbers calculated once each. Here is an example:

50 100 5 1 2 10			
			Target Number 569
			Your Number 569
100	*	5	= 500
500	+	50	= 550
10	*	2	= 20
20	–	1	= 19
550	+	19	= 569

If you try to use a number twice or a non-existent number the computer will tell you of an error and give you no points.

The final round is the conundrum. Here a nine letter word is jumbled up and you have 30 seconds to unscramble the word and enter the correct original.

Any round can be terminated early by pressing the key which you would expect to press at the end of the round, for example the length of the word or the first figure in your calculated number.

The object of the game is to score as many points as possible.

For those of you who write your own programs I wasted at least two hours in writing this game due to a bug in the old Basic cartridge.

Having originally designed the game on an 800XL with version B Basic I came across a bug.

After saving a program several times your version B Basic will occasionally scramble your Basic program and lose it completely. This is due to the fact that the B version kindly adds 16 bytes to your program when you save it!

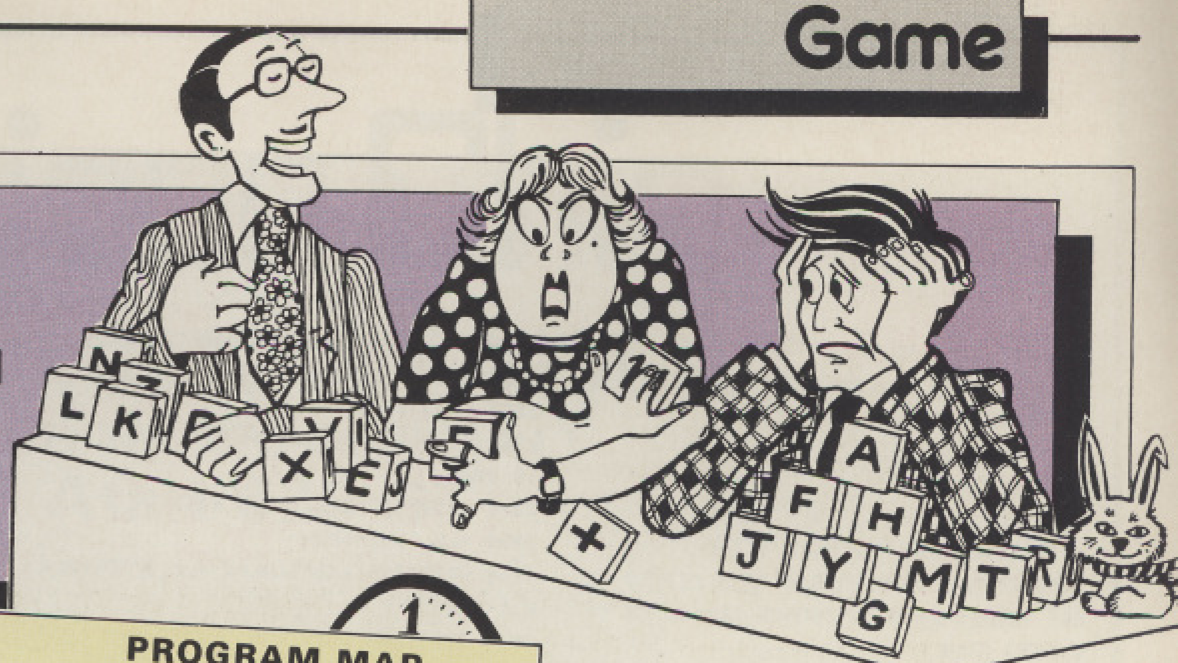
Listing your program to tape or

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	1718	2	1170	3	1319
10	676	20	5558	40	496
100	3804	105	1201	110	1500
115	821	116	4515	120	1400
130	474	140	3253	149	565
150	4671	160	2334	170	5688
175	5991	180	2798	200	3407
210	3254	220	1599	300	533
310	2024	320	2674	330	552
340	2529	350	565	400	2599
410	1395	420	937	430	1396
440	821	450	565	500	3052
510	1348	520	926	530	979
540	821	550	565	1000	1201
1010	3728	1015	2515	1020	5043
1030	6797	1040	2513	1100	798
1110	5358	1115	506	1116	1416
1117	1398	1118	607	1120	3978
1121	1748	1122	1393	1125	971
1129	605	1130	4259	1131	1743

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1133	1387	1135	965	1140	1905
1150	474	1160	2038	1170	623
1180	2860	1185	2669	1190	1916
1200	1352	1210	628	1220	590
1225	4607	1230	3508	1300	3089
1310	799	1320	2974	1330	475
1340	606	1370	474	1390	605
1500	5374	1510	2933	1520	1012
1530	1256	1600	1427	1610	626
1620	603	2000	1194	2010	3727
2020	3204	2030	3408	2040	4178
2100	2284	2110	2965	2120	1279
2150	757	2160	731	2200	3634
2210	4731	2220	4581	2230	1496
2240	628	2250	3878	2260	5336
2270	1286	2280	1638	2300	865
2310	1874	2320	4739	2330	1985
2340	1568	2350	3403	2355	1421
2360	1215	2370	1217	2380	1221
2390	1225	2400	1357	2405	1536
2410	2126	2420	3812	2430	605
2500	2733	2520	1620	3000	1031
3010	2732	3030	3335	3040	3415
3050	2006	3110	3301	3120	812
3130	2187	3140	1090	3150	1400

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
3160	2052	3170	1306	3180	623
3190	2240	3200	5283	3210	2258
3220	626	3499	1755	3500	1050
3501	1083	3502	1067	3503	1082
3504	1039	3505	1060	3506	1075
3507	1051	3508	1078	3509	1058
3510	1075	3511	1070	3512	1068
3513	1053	3514	1081	3515	1086
3516	1059	3517	1057	3518	1081
3519	1075	3520	1089	3521	1068
3522	1106	3523	1078	3524	1097
3525	1067	3526	1029	3527	1094
3528	1103	3529	1065	4000	1200
4060	1399	4070	3408	4080	1616
4090	2420	4100	2993	4105	2834
4106	3286	4110	8761	4120	2162
4125	2577	4130	3120	4135	3031
4140	1609	4150	3854	4200	496
5000	2097	5010	4413	5020	1616
5030	3157	5035	1554	5040	4228
5050	4962	5060	2709	5070	2178
5080	1900	5090	4805	5095	5965
5096	474	5098	2999	5100	1606
5110	2967	5120	935	5130	1753
5140	554	5190	565		



Can you unscramble MIKE ROWE's letter and number puzzles before your time is up?

disc eliminates this. I therefore started to use my old version A Basic cartridge to finish Countdown.

Suddenly the number checking routine went haywire. After much cursing and chewing of pencils I traced this to the VAL( ) function which apparently does not operate correctly after using it once.

The ?#6;B in line 340 which prints the value of B out of view behind the text window for some reason clears this and allows the program to function normally. I hope this saves someone else a lot of wasted time.

PROGRAM MAP

20-40	Loop.
100-149	Countdown routine.
150-190	Wait for answer.
200-220	Check for valid numbers.
300-350	Check number routine.
400-550	Sound routines.
1000-1620	Letters game.
2000-2520	Numbers game.
3000-3200	Conundrum game.
4000-4200	Score page.
5000-5190	Initialise.

MAIN VARIABLES

I and J	FOR ... NEXT variables.
A$	Used in many parts, in number checker and as your word in letters game.
CONST$	Holds consonants for random choice.
VOWEL$	Holds vowels for random choice.
ROUND	Round of play.
C$	Original word in conundrum.
B$	Mixed up word in conundrum.
A,B,C,D	Used in calculator routine.

```
1 REM COMPUTER COUNTDOWN
2 REM BY MIKE ROWE
3 REM ATARI USER 1985
10 GOSUB 5000
20 ROUND=ROUND+1:ON ROUND GOTO 1000,10
00,1000,2000,1000,1000,1000,2000,3000:
REM SEVEN ROUNDS
40 GOTO 20
100 POKE 764,255:FOR I=30 TO 0 STEP -1
:REM COUNTDOWN ROUTINE
105 SOUND 0,50+I*2,10,10
110 POSITION 12,8:? #6;I;" "
115 SOUND 0,0,0,0
116 IF PEEK(764)<>255 THEN POP :RETURN
 :REM IF A KEY IS PRESSED RETURN
120 FOR J=1 TO 400:NEXT J
130 NEXT I
140 SOUND 0,100,10,10:FOR I=1 TO 50:NE
XT I:SOUND 0,0,0,0
149 RETURN
150 FOR I=1 TO 500:REM WAIT FOR KEY TO
 BE PRESSED - BUT ONLY FOR SO LONG!
160 IF PEEK(764)<>255 THEN POP :RETURN
170 NEXT I:SOUND 0,255,10,10:? "YOU'RE
 TAKING TOO LONG!":FOR I=1 TO 500:NEXT
 I:SOUND 0,0,0,0
175 IF PEEK(764)=255 THEN POP :GOSUB 4
00:GOTO 4000:REM IF NO KEY PRESSED - N
O SCORE & END ROUND
180 RETURN :REM IF KEY PRESSED THEN RE
TURN
200 FOR I=1 TO INDEX:IF B=A(I) THEN A(
I)=0:POP :RETURN
210 NEXT I:? "ERROR - NUMBER NOT AVAIL
ABLE OR USED"
220 POP :GOSUB 400:GOTO 4000
300 I=1:A$=""
310 GET #1,A:IF A<48 OR A>57 THEN 330
320 ? #6;CHR$(A);:A$(I,I)=CHR$(A):I=I+
1:GOTO 310
330 TRAP 350
340 B=VAL(A$):POSITION 0,20:? #6;B:RET
URN
350 RETURN
400 SOUND 0,40,2,15:REM GOT IT WRONG S
OUND
410 FOR I=1 TO 100:NEXT I
420 SOUND 0,60,2,15
430 FOR I=1 TO 200:NEXT I
440 SOUND 0,0,0,0
450 RETURN
500 FOR I=80 TO 20 STEP -5:REM GOT IT
RIGHT SOUND
510 FOR J=14 TO 2 STEP -4
520 SOUND 0,I,10,J
530 NEXT J:NEXT I
540 SOUND 0,0,0,0
550 RETURN
1000 REM LETTERS GAME
1010 GRAPHICS 2:SETCOLOR 2,0,0:SETCOLO
R 3,8,8:SETCOLOR 0,3,8
1015 POSITION 4,0:? #6;"letters game"
1020 POSITION 2,2:? #6;"choose v or c"
:REM INVERSE
1030 CONST$="BCDFGHJKLMNPQRSTVWXYZBCDF
GHKLMNPRSTYBDGHLMNPRSTDGLNRSTDNRSTDNRS
T":CL=LEN(CONST$)
1040 VOWEL$="AEIOUAEIOEE":VL=LEN(VOWEL
$)
1100 FOR I=1 TO 9
1110 POSITION 2,4:? #6;"letter ";CHR$(
I+96+48):REM letter IN INVERSE
1115 GET #1,A
1116 IF A=ASC("V") THEN 1120
1117 IF A=ASC("C") THEN 1130
1118 GOTO 1115
1120 R=INT(RND(0)*VL+1):REM CHOOSE VOW
EL AT RANDOM FROM VOWEL$
1121 IF VOWEL$(R,R)="*" THEN 1120
1122 A(I)=ASC(VOWEL$(R,R))
1125 VOWEL$(R,R)="*"
1129 GOTO 1140
1130 R=INT(RND(0)*CL+1):REM CHOOSE CON
SONANT AT RANDOM FROM CONST$
1131 IF CONST$(R,R)="*" THEN 1130
1133 A(I)=ASC(CONST$(R,R))
1135 CONST$(R,R)="*"
1140 POSITION I*2,6:? #6;CHR$(A(I))
1150 NEXT I
1160 POSITION 0,8:? #6;"COUNTDOWN "
1170 GOSUB 100
1180 ? "ENTER LENGTH OF WORD":GOSUB 15
0:GET #1,L
1185 IF L<49 OR L>57 THEN ? "PARDON!":
GOTO 1180
1190 L=VAL(CHR$(L)):? L;" LETTERS"
1200 ? "ENTER YOUR WORD"
1210 GOSUB 150
1220 INPUT A$
1225 IF LEN(A$)<>L THEN ? A$;" IS NOT
";L;" LETTERS LONG":GOSUB 400:GOTO 400
0
1230 POSITION 0,8:? #6;"
     ":POSITION 0,8:? #6;"  ";A$
1300 FOR I=1 TO LEN(A$):REM CHECK VALI
DITY OF WORD
```

```
1310 FOR J=1 TO 9
1320 IF A$(I,I)=CHR$(A(J)) THEN A(J)=0
:POP :GOTO 1370
1330 NEXT J
1340 GOTO 1600
1370 NEXT I
1390 GOTO 1500
1500 IF L=9 THEN L=18:? "A 9 LETTER WO
RD! DOUBLE POINTS!":GOSUB 500:GOSUB 50
0:GOTO 1520
1510 ? CHR$(125):? "  CORRECT - ";L;"
POINTS SCORED"
1520 SCORE=SCORE+L
1530 GOSUB 500:GOTO 4000
1600 ? "ERROR - NO POINTS"
1610 GOSUB 400
1620 GOTO 4000
2000 REM NUMBERS GAME
2010 GRAPHICS 1:SETCOLOR 2,0,0:SETCOLO
R 3,8,8:SETCOLOR 0,3,8
2020 DL=PEEK(560)+PEEK(561)*256:POKE D
L+3,71:POKE DL+7,7
2030 POSITION 3,0:? #6;"numbers game":
POSITION 0,2
2040 ? "ENTER NUMBER OF HIGH NUMBERS R
EQUIRED":INPUT R:? CHR$(125)
2100 FOR I=1 TO 6:REM CHOOSE 6 NUMBERS
2110 IF R>=I THEN A(I)=25*(INT(RND(0)*
4)+1):GOTO 2150
2120 A(I)=INT(RND(0)*10)+1
2150 ? #6;A(I);" ";
2160 NEXT I:? #6
2200 T=INT(RND(0)*899+100):REM CHOOSE
RANDOM TARGET NUMBER
2210 ? #6:? #6;"target number ";T:REM
INVERSE
2220 POSITION 0,8:? #6;"COUNTDOWN":GOS
UB 100:POSITION 0,8:? #6;"
         "
2230 ? "ENTER YOUR NUMBER"
2240 GOSUB 150
2250 INPUT NUM:POSITION 0,5:? #6;" you
r  number ";NUM:? #6
2260 IF ABS(T-NUM)>10 THEN ? "NOT WITH
IN 10 OF TARGET - NO POINTS":GOSUB 400
:GOTO 4000
2270 ? "LETS CHECK THAT"
2280 REM CHECK CALCULATIONS
2300 Y=7:INDEX=10
2310 POSITION 0,Y:GOSUB 300:A1=A
2320 IF A<>42 AND A<>43 AND A<>45 AND
A<>47 THEN POSITION 0,Y:? #6;"    ":GO
TO 2310
2330 POSITION 5,Y:? #6;CHR$(A);:C=B
2340 POSITION 7,Y:GOSUB 300
2350 IF A<>61 THEN POSITION 0,Y:? #6;"
            ":GOTO 2310
2355 POSITION 12,Y:? #6;"="
2360 IF A1=42 THEN D=B*C
2370 IF A1=43 THEN D=B+C
2380 IF A1=45 THEN D=C-B
2390 IF A1=47 THEN D=C/B
2400 POSITION 14,Y:? #6;D
2405 GOSUB 200:B=C:GOSUB 200
2410 A(INDEX)=D:Y=Y+1:INDEX=INDEX+1
2420 IF D=NUM THEN ? "CORRECT - WELL D
ONE!":GOSUB 500:GOTO 2500
2430 GOTO 2310
2500 IF T-NUM=0 THEN SCORE=SCORE+10:GO
TO 4000
2520 SCORE=SCORE+7:GOTO 4000
3000 REM CONUNDRUM
3010 GRAPHICS 2:SETCOLOR 2,0,0:SETCOLO
R 3,9,8
3030 POSITION 0,1:? #6;"countdown conu
ndrum"
3040 POSITION 0,2:FOR I=1 TO 19:? #6;C
HR$(255);:NEXT I:? #6
3050 POSITION 1,8:? #6;"COUNTDOWN"
3110 RESTORE RND(0)*30+3500:REM CHOOSE
 WORD FROM LIST
3120 READ A$:C$=A$
3130 FOR I=1 TO 9:REM MIX UP LETTERS
3140 R=INT(RND(0)*9+1)
3150 IF A$(R,R)=" " THEN 3140
3160 B$(I,I)=A$(R,R):A$(R,R)=" ":NEXT
I
3170 POSITION 4,5:? #6;B$
3180 GOSUB 100
3190 ? "ENTER WORD":GOSUB 150:INPUT A$
3200 IF A$=C$ THEN ? CHR$(125);"CORREC
T - 10 POINTS":SCORE=SCORE+10:GOSUB 50
0:GOTO 4000
3210 ? "WRONG WORD - SORRY NO POINTS"
3220 GOSUB 400
3499 REM WORDS FOR CONUNDRUM
3500 DATA PRACTICAL
3501 DATA EXECUTION
3502 DATA TELEPHONE
3503 DATA RELIGIOUS
3504 DATA INDELIBLE
3505 DATA INDICATOR
3506 DATA APARTMENT
3507 DATA BREATHING
3508 DATA CLOCKWORK
3509 DATA LUBRICATE
3510 DATA ACCESSORY
3511 DATA ADMISSION
3512 DATA BEHAVIOUR
3513 DATA CELESTIAL
3514 DATA ELOCUTION
3515 DATA FORMALITY
3516 DATA GUARANTEE
3517 DATA RECOMMEND
3518 DATA SECRETARY
3519 DATA TANTALIZE
3520 DATA YESTERDAY
3521 DATA DECIDUOUS
3522 DATA HYPNOTISM
3523 DATA JUDICIOUS
3524 DATA KNOWINGLY
3525 DATA MAGNETIZE
3526 DATA OBEDIENCE
3527 DATA UNANIMOUS
3528 DATA ZEALOUSLY
3529 DATA WATERFALL
4000 REM SCORE SCREEN
4060 FOR I=1 TO 500:NEXT I
4070 GRAPHICS 2:POKE 752,1:SETCOLOR 2,
0,0:SETCOLOR 3,9,8
4080 DL=PEEK(560)+PEEK(561)*256
4090 POKE DL+10,6:POKE DL+12,6:POKE DL
+14,6
4100 POSITION 2,1:? #6;"countdown scor
es"
4105 POSITION 2,2:? #6;"______________
__"
4106 IF ROUND=9 THEN POSITION 5,5:? #6
;"game over"
4110 IF ROUND<9 THEN POSITION 3,5:? #6
;"round number ";CHR$(ROUND+144):REM r
ound number IN INVERSE
4120 POSITION 6,7:? #6;"SCORE ";SCORE
4125 POSITION 3,9:? #6;"HI-SCORE ";PEE
K(1536)
4130 ? :? :? "       PRESS START TO CON
TINUE"
4135 IF ROUND=9 THEN GOSUB 500:GOSUB 5
00:GOSUB 500
4140 IF PEEK(53279)=7 THEN 4140
4150 IF ROUND=9 AND SCORE>PEEK(1536) T
HEN POKE 1536,SCORE:RUN
4200 GOTO 20
5000 REM INITIALISE & TITLE SCREEN
5010 GRAPHICS 7:SETCOLOR 2,0,0:SETCOLO
R 3,8,8:SETCOLOR 0,3,8:POKE 559,0
5020 DL=PEEK(560)+PEEK(561)*256
5030 FOR I=DL+6 TO DL+17:POKE I,6:NEXT
 I:POKE DL+3,70
5035 POKE DL+7,7:POKE DL+10,2
5040 POKE DL+70,65:POKE DL+71,PEEK(560
):POKE DL+72,PEEK(561):POKE 559,34
5050 POKE 87,1:POSITION 5,2:? #6;"coun
tdown":REM INVERSE
5060 POSITION 10,5:? #6;"By Mike Rowe
 1985"
5070 POSITION 4,10:? #6;"PRESS START"
5080 POSITION 5,12:? #6;"TO BEGIN"
5090 POKE 87,7:COLOR 2:X1=75:Y1=32:RA=
24:DEG :PLOT X1,Y1+RA:REM DRAW A CIRCL
E
5095 FOR I=0 TO 360 STEP 5:DRAWTO X1+S
IN(I)*RA,Y1+COS(I)*RA:IF PEEK(53279)<>
7 THEN POP :GOTO 5110
5096 NEXT I
5098 POKE 765,2:POSITION X1,Y1-RA:XIO
18,#6,0,0,"S:"
5100 IF PEEK(53279)=7 THEN 5100
5110 DIM A$(10),A(30),B$(10),C$(10),CO
NST$(80),VOWEL$(20)
5120 OPEN #1,4,0,"K:"
5130 FOR I=1 TO 30:A(I)=0:NEXT I
5140 ROUND=0
5190 RETURN
```

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Going out in a blaze of graphics glory

THIS month's article, the last in the series, takes a look at some non-standard graphics modes and rounds off with a non-standard display.

MIKE ROWE concludes his series on how to produce brighter displays

Right at the beginning I said 16 modes were available to the Atari user, but this can be stretched by a further 12 modes when you include text windows where available.

In reality things are not this simple. These 28 modes are only those directly available using the operating system on XL and XE models only.

Graphics modes 12-15 are available on the 400 and 800 but only by creating your own display list as demonstrated in the second article in the series.

In reality it is possible to get many more modes than this – would you believe over 100 different graphics modes?

Firstly there is another Antic mode which is not supported directly by any of the current machines. This is Antic Mode 3, which can be obtained easily by creating your own display list.

It is essentially similar to Graphics 0 but with one difference – it allows true descenders. That is, the tail in the small y comes properly below the rest of the letter.

This is because it interprets the data for the character differently. A normal character is 8 pixels wide by 8 lines deep. In Antic Mode 3 it is 10 lines deep and the two bottom scan lines appear blank. In addition some characters, notably lower case as well as a few others, are displayed with the first two bytes of the character appearing at the bottom of the character (see figures 1 to 5).

As you might imagine, the standard character set would not be suitable for this mode. You really need a custom set.

In the example in Demo 1 I have used the internal set for briefness. However I have offset the character set one byte lower and moved the lower case set's last bytes to the first bytes. This gives a workable version of the character set.

In addition, to show the true lower case, I have redefined some of the characters to give true descenders.

Secondly several useful modes are based on Graphics 9, 10, 11. As Dave Russell mentioned last month, the first Ataris produced did not have Graphics 9-11.

Before late 1979 the computer had a chip called CTIA, which provided Graphics 0 to 8 only. After this they fitted the GTIA chip allowing the three new modes.

In fact the display list is exactly the same for these modes as it is for Graphics 8.

The secret of the difference lies in memory location 623. Numbers from 0 to 15 are poked here in the use of player-missile graphics to decide priority – that is, which player shows in front or behind what.

However numbers from 64 up – bits 6 and 7 – will enable the GTIA modes.

If in Graphics 8 you POKE 623,64 (bit 6) you get Graphics 9. POKE 623,128 (bit 7) gives Graphics 10, and POKE 623,192 (bits 6 and 7) gives Graphics 11.

Leading on logically from this, the same could be done in any mode. This gives a theoretical maximum of 52 full screen modes and a further 52 modes with text windows. That is a staggering 104 graphics modes.

Don't get too excited. This is indeed possible, but most of them are quite useless, some are identical to others and all the text windows are illegible.

The last point can be circum-

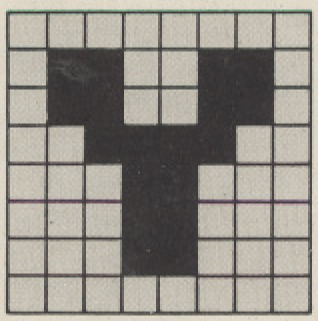


Figure I: Normal capital letter

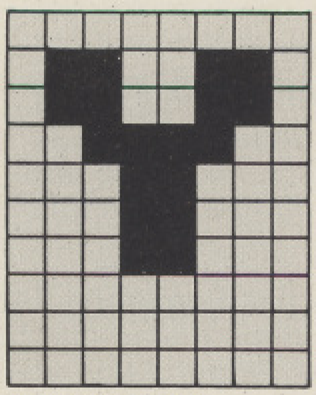


Figure II: Capital letter in Antic 3

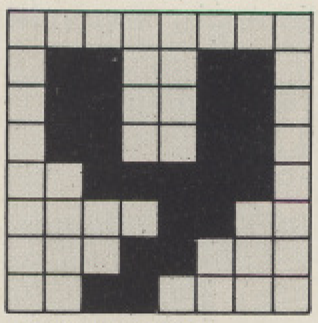


Figure III: Normal lower case

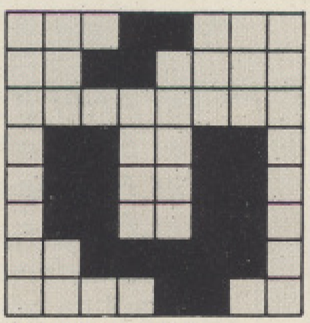


Figure IV: Lower case y as redefined

```
10 REM DEMO 1 : ANTIC MODE 3
50 GOSUB 1000
60 GOSUB 3000
70 GOSUB 5000
80 GOSUB 4000
90 END
1000 REM CONVERT TO ANTIC MODE 3
1010 GRAPHICS 0:POKE 559,0:REM START WITH GRAPHICS 0 AND SWITCH OFF SCREEN
1020 DL=PEEK(560)+PEEK(561)*256:REM FIND START OF DISPLAY LIST
1030 POKE DL+3,64+3:REM CHANGE 20 LINES TO ANTIC MODE 3
1040 FOR I=6 TO 24:POKE DL+I,3:NEXT I
1050 POKE DL+25,65:POKE DL+26,PEEK(560):POKE DL+26,PEEK(DL+27):REM END DISPLAY LIST
1060 POKE 559,34:REM TURN SCREEN BACK ON
1090 RETURN
3000 REM MOVE CHARACTER SET TO RAM AND REDEFINE CHARACTERS
3010 RAMTOP=PEEK(106):REM FIND TOP OF MEMORY
3020 RAMTOP=RAMTOP-8:REM MOVE BACK 8 PAGES=2K - 1K FOR SCREEN , 1K FOR CHARACTER SET
3030 CHSET=57344:RAMSET=RAMTOP*256:REM LOCATIONS OF OLD SET IN ROM AND NEW SET
3040 FOR I=0 TO 1024:REM MOVE SET FROM ROM TO RAM BUT OFFSET BY 1
3050 POKE RAMSET+I,PEEK(CHSET+I-1)
3060 NEXT I
3070 FOR I=0 TO 127:REM MOVE BOTTOM OF CHARACTER TO TOP
3080 POKE RAMSET+I*8,PEEK(CHSET+I*8+7)
3090 NEXT I
3180 POKE 756,RAMTOP:REM TELL OS WHERE SET IS
3190 RETURN
4000 REM READ IN NEW CHARACTERS
4010 RESTORE 4100
4020 READ CHAR:IF CHAR=-1 THEN RETURN :REM FIND WHICH CHARACTER IS TO BE DEFINED
4030 FOR I=0 TO 7:REM READ IN NEW DATA AND POKE INTO MEMORY
4050 READ A
4060 POKE RAMSET+CHAR*8+I,A
4070 NEXT I
4080 GOTO 4020
4100 DATA 12,0,0,0,0,0,24,24,48
4105 DATA 14,0,0,0,0,0,24,24,0
4110 DATA 27,0,0,24,24,0,24,24,48
4115 DATA 26,0,0,24,24,0,24,24,0
4117 DATA 102,24,0,14,24,62,24,24,24
4120 DATA 103,102,60,0,62,102,102,62,6
4130 DATA 106,102,60,6,0,6,6,6,6
4140 DATA 112,96,96,0,124,102,102,124,96
4150 DATA 113,6,6,0,62,102,102,62,6
4160 DATA 121,102,60,0,102,102,102,62,6
4200 DATA -1
5000 REM PRINT CHARACTERS ON SCREEN
5005 POSITION 12,1:? " ANTIC MODE 3 "
5010 POSITION 2,5
5020 FOR I=32 TO 123
5030 ? "Ɛ";CHR$(I);
5040 NEXT I:?
5050 FOR I=160 TO 251
5060 ? "Ɛ";CHR$(I);
5070 NEXT I:?
5080 ? :? "TRUE DESCENDERS ON CHARACTERS fgjpqy"
5090 RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	4652	50	672	60	674
70	676	80	675	90	294
1000	5193	1010	4804	1020	3841
1030	3283	1040	2138	1050	5141
1060	2404	1090	565	3000	11262
3010	2773	3020	5400	3030	5132
3040	4064	3050	2036	3060	474
3070	3475	3080	2246	3090	474
3180	2845	3190	565	4000	5014
4010	845	4020	5185	4030	3718
4050	431	4060	1545	4070	474
4080	605	4100	1427	4105	1367
4110	1548	4115	1483	4117	1701
4120	1799	4130	1497	4140	1929
4150	1650	4160	1847	4200	461
5000	5870	5005	3833	5010	876
5020	953	5030	796	5040	639
5050	1007	5060	796	5070	639
5080	3212	5090	565		

Demo I

navigated and will be dealt with later.

Probably three new modes are definitely usable and significantly different. These are shown in Demos II and III.

Demo II is a 7 colour 80×96 mode which takes only 4k of memory. Essentially it is a cross between Graphics 7 and Graphics 10. For some reason you can only get seven out of the eight colours of Graphics 10. Notice also that the colour registers used are not 0-7 as →

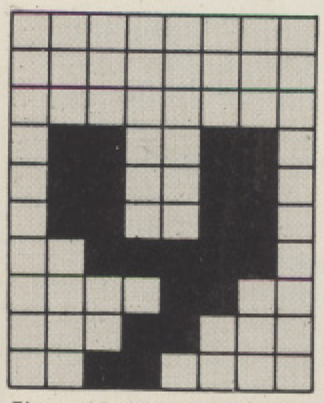


Figure V: Redefined lower case y as displayed in Antic 3

```
10 REM DEMO 2 : 7 COLOUR 80X96
20 DIM C(7):REM ARRAY FOR COLOR VALUES
100 GRAPHICS 7+16:REM START WITH FULL SCREEN GRAPHICS 7
110 POKE 623,128:REM FOOL GTIA INTO THINKING THIS IS A GTIA MODE
120 POKE 87,10:REM FOOL OS INTO THINKING THIS IS GRAPHICS 10
130 REM SET 7 COLOUR VALUES BY POKING TO THE COLOUR REGISTERS
150 POKE 704,0
160 POKE 705,10
170 POKE 706,50
180 POKE 708,136
190 POKE 709,162
200 POKE 710,200
210 POKE 712,250
220 FOR I=0 TO 6:READ A:C(I)=A:NEXT I:REM READ COLOUR ARRAY DATA
230 DATA 0,2,3,9,10,11,8
300 REM DRAW DESIGN
310 FOR I=0 TO 6
320 COLOR C(I)
330 A=I*10
340 FOR J=0 TO 9:PLOT A,0:DRAWTO A+J,50
350 NEXT J
360 NEXT I
370 FOR I=0 TO 6
380 COLOR C(I)
390 FOR J=0 TO 8 STEP 2
400 FOR K=0 TO 18 STEP 2
410 PLOT I*10+J,60+K
420 NEXT K
430 NEXT J
440 FOR J=1 TO 9 STEP 2
450 FOR K=1 TO 19 STEP 2
460 PLOT I*10+J,60+K
470 NEXT K
480 NEXT J
490 NEXT I
500 GOTO 500:REM KEEP SCREEN IN VIEW
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5033	20	2466	100	3606
110	4110	120	3871	130	4137
150	645	160	697	170	702
180	760	190	760	200	745
210	752	220	4096	230	1128
300	2847	310	794	320	699
330	388	340	2316	350	475
360	474	370	794	380	699
390	1251	400	1302	410	1024
420	476	430	475	440	1253
450	1304	460	1024	470	476
480	475	490	474	500	2243

Demo II

Colour register location	Colour numbers to use	Colour displayed
704	0, 1, 4, 5	0 (Background)
705	2, 6	2
706	3, 7	3
707	–	–
708	9	9
709	10	10
710	11	11
711	–	–
712	8, 12, 13, 14, 15	8

Table I

expected but are as in Table I.

Apart from this, the mode is just like Graphics 10 but with half the vertical resolution and half the memory usage. Similar hybrid modes can be used with Graphics 9 and 11 but are probably less useful.

Demo III is a seven colour 20×12 text mode which is a cross between graphics 2 and Graphics 10 (by using Graphics 1 a seven colour 20×24 mode can be obtained). Again, because of the way the operating system works, seven colours as above are available. Also, as in Graphics II proper, only 64 different characters can be displayed at once – characters 32 to 95 – space to Z.

If the other characters are printed they appear as an allowable character but in a different combination of colours. This is much the same as Graphics 2 and is how the different colours are obtained.

However this cannot explain the availability of seven colours. This occurs because of the way the character set data is interpreted. A normal character is lit pixel by pixel controlled by eight bits giving a horizontal resolution of eight per

```
10 REM DEMO 3 : 7 COLOUR 20X12 TEXT
20 DIM C(7):REM STORE COLOURS IN ARRAY
100 GRAPHICS 2+16:REM START WITH GRAPHICS 2 (GRAPHICS 1 FOR A 20X24 MODE)
110 POKE 623,128:REM FOOL GTIA INTO THINKING IT IS IN A GTIA MODE (GR.10)
130 REM POKE COLOURS INTO COLOUR REGISTERS
150 POKE 704,0
160 POKE 705,168
170 POKE 706,136
175 POKE 707,70
190 POKE 709,26
205 POKE 711,58
210 POKE 712,14
220 FOR I=0 TO 6:READ A:C(I)=A:NEXT I
230 DATA 0,2,3,9,10,11,8
300 RAMTOP=PEEK(106):R=RAMTOP-8:POKE 756,R:REM RESERVE SPACE FOR NEW CHARACTER SET
310 FOR I=0 TO 511:REM READ IN NEW CHARACTER SET
320 READ A
330 POKE R*256+I,A
340 NEXT I
500 REM PRINT ON SCREEN
510 POSITION 5,0:? #6;"GTIA TEXT"
520 ? #6:? #6;"this mode gives you a text mode with ";CHR$(151);"  colours which is 20 by 12 in size";CHR$(14)
530 ? #6;"the characters can  be in up to seven   different colours   or multicoloured";CHR$(142)
540 ? #6:? #6;"Aaa+";CHR$(11);CHR$(139);" ";CHR$(28);CHR$(30);" SPACE BAR"
580 POKE 764,255
590 IF PEEK(764)=255 THEN 590
600 ? #6;CHR$(125)
610 FOR I=1 TO 20:? #6;CHR$(15);:NEXT I
620 ? #6:? #6;"2 COLOUR GRAPHICS ";CHR$(96+128)
630 ? #6:? #6;"3 COLOUR GRAPHICS ";CHR$(123)
640 ? #6:? #6;"MULTICOLOURED
      GRAPHICS"
650 ? #6:? #6;"   ";CHR$(252);CHR$(253);CHR$(126);CHR$(127);CHR$(254);CHR$(255);"^_";CHR$(126);CHR$(127)
680 POKE 764,255
690 IF PEEK(764)=255 THEN 690
700 ? #6;CHR$(125):GOTO 500
1000 DATA 0,0,0,0,0,0,0,0,0,48,48,48,48,48,0,48,0,204,204,204,0,0,0,0
1010 DATA 0,204,252,204,204,252,204,0,0,48,252,192,252,12,252,48,0,204,12,60,48,240,192,204
1020 DATA 0,192,204,48,48,204,204,48,0,48,48,192,0,0,0,0,0,48,192,192,192,192,192,48
1030 DATA 0,48,12,12,12,12,12,48,0,32,168,136,136,168,136,136,0,16,84,68,68,84,68,68
1040 DATA 0,0,0,0,0,48,48,192,0,0,0,0,252,0,0,0,0,0,0,0,0,0,48,48
1050 DATA 254,250,234,169,165,149,87,95,0,252,204,204,204,204,204,252,0,48,240,48,48,48,48,252
1060 DATA 0,252,204,12,60,240,192,252,0,252,12,12,60,12,12,252,0,204,204,204,252,12,12,12
1070 DATA 0,252,192,192,252,12,204,252,0,252,192,192,252,204,204,252,0,252,12,12,12,12,12,12
1080 DATA 0,252,204,204,252,204,204,252,0,252,204,204,252,12,12,252,0,0,48,48,0,48,48,0
1090 DATA 0,0,48,48,0,48,48,192,255,239,171,187,187,171,187,187,0,0,0,252,0,252,0,0
1100 DATA 85,165,153,153,165,153,153,165,0,48,204,12,48,48,0,48,255,235,235,235,235,235,235,255
1110 DATA 0,48,252,204,204,252,204,204,0,240,204,204,240,204,204,240,0,252,192,192,192,192,192,252
1120 DATA 0,240,204,204,204,204,204,240,0,252,192,192,240,192,192,252,0,252,192,192,240,192,192,192
1130 DATA 0,252,192,192,192,204,204,252,0,204,204,204,252,204,204,204,0,252,48,48,48,48,48,252
1140 DATA 0,12,12,12,12,12,204,252,0,204,204,204,240,240,204,204,0,192,192,192,192,192,192,252
1150 DATA 0,204,252,252,204,204,204,204,0,240,204,204,204,204,204,204,0,252,204,204,204,204,204,252
1160 DATA 0,252,204,204,252,192,192,192,0,48,204,204,204,204,204,60,0,240,204,204,240,204,204,204
1170 DATA 0,252,204,192,252,12,204,252,0,252,48,48,48,48,48,48,0,204,204,204,204,204,204,252
1180 DATA 0,204,204,204,204,204,252,48,0,204,204,204,204,252,252,204,0,204,204,48,48,48,204,204
1190 DATA 0,204,204,204,252,48,48,48,0,252,12,12,48,192,192,252,0,20,85,255,255,239,227,239
1200 DATA 34,64,65,255,255,255,255,34,0,63,16,208,240,240,252,32,0,42,255,221,221,255,255,32
1210 DATA 0,160,252,220,220,254,252,32
```

Demo III

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	6028	20	2487	100	4626
110	4576	130	2867	150	645
160	762	170	758	175	705
190	708	205	706	210	699
220	2184	230	1128	300	5506
310	2994	320	431	330	918
340	474	500	3661	510	3099
520	8899	530	17876	540	5609
580	764	590	1560	600	810
610	2191	620	4804	630	4637
640	5528	650	5962	680	764
690	1561	700	1387	1000	3371
1010	4559	1020	4232	1030	4247
1040	3144	1050	4777	1060	4424
1070	4601	1080	4340	1090	4179
1100	4831	1110	4932	1120	5000
1130	4745	1140	4709	1150	4949
1160	4862	1170	4631	1180	4764
1190	4601	1200	4643	1210	1811

character. This new mode is more like Graphics 12 (Antic 4) in that the eight bits give a horizontal resolution of four per character – that is, each pixel of the character is controlled by two bits allowing control over the colour of each pixel. The character is therefore laid out as in Figure VI.

In Graphics 12 this gives four colours (five with inverse) but in addition to the other method of colour selection mentioned before seven colours become available in the new mode. Therefore a custom character set is essential.

Due to the peculiarities of this mode, normal capital letters do not show up. Lower case and inverse will print the character in different colours as will printing characters 0-31 and 96-127 normally and in inverse. This is not straightforward in the way it occurs, and is best discovered by experimentation.

All the GTIA modes interpret character set data like this and this is why the text windows are illegible. A text window is easily obtained, however, by using a Display List Interrupt to change back from the GTIA mode at the text window. This is shown in Demo IV, but the principle will work with any GTIA mode.

Some of the examples above may be difficult to grasp at first, especially III, but if studied carefully they are reasonably straightforward. Feel free to experiment with the programs to discover more.

Finally, to illustrate the power of the display list, I'd like to answer a problem posed by Simon Crawley. He wants a display comprising one row of Mode 2, 112 rows of Mode 15 and eight rows of Mode 0.

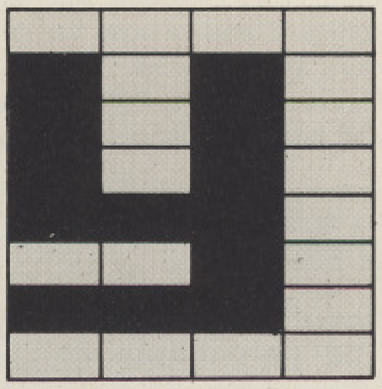


Figure VI: Graphics 2/10 letter y.

Although quite possible this is far from the easiest combination of screen modes. Firstly he has based his screen on an 8k mode – Graphics 15.

You may remember I mentioned any screen display crossing a 4k boundary needs a new load memory scan instruction in the display list where the 4k boundary is crossed.

In the 8k modes this therefore means that the list of mode numbers is interrupted half way down by three numbers.

The first is the mode number – say 14 for Basic mode 15 – + 64. This tells the operating system that the next two numbers are the low and high bytes of the screen memory after this point, that is it points to the next 4k block of screen memory.

If you now interfere with the display list above this the screen

memory may well no longer remain consecutive at this point.

The second problem lies in the decision to have a Graphics 2 line at the top of the display. This obviously causes problems as above. However in addition this mode requires ony 20 bytes of memory per line. Graphics 15 requires 40 bytes per line.

As the OS expects 40 bytes per line everything below the Graphics 2 line will be offset by half the screen. Also the second 4k block of screen memory will be 20 bytes out of alignment with the first 4k of screen memory.

So much for the problems. Now the solution!

Well there are many solutions really but I think the easiest and probably shortest is shown in Demo V.

Here I have considered each of the three modes as individual screens. I started with a Graphics 15 full screen display, changed the top line to Graphics 2 and kept a track of the location of the start of screen memory for this line in LO1 and HI1.

I then inserted a new load memory scan instruction (LMS) and offset the screen memory for this by 120 bytes. This is to avoid the necessity for moving the location of the later LMS which is there to cope with the 4k boundary which is crossed by Graphics 15.

I again kept track of the start of this block of screen memory in LO2 and HI2. Finally after the requisite number of Graphics 15 lines I again inserted an LMS for the eight Graphics 0 lines. The display list is ended straight after this.

Now we have the display needed to treat each part as a separate screen or possibly as a sort of window. This means as well as poking the mode of the area of screen we are using into location 87, we must also poke the start of memory for that block of screen into 88 and 89.

The easiest way to do this is as a set of subroutines to be called. This will also mean that each block starts at location 0,0, thus avoiding printing to position 117,4 which could otherwise occur. The OS would not allow this in Graphics 0.

Phew – glad I got that off my chest. I think I'll take a break now and finish that game I'm writing.

```
10 REM DEMO 4 : GTIA MODE TEXT WINDOW
20 GRAPHICS 0
30 POSITION 2,10:? "WHAT GRAPHICS MODE
 (9-11)";:INPUT MODE
40 GPRIOR=64*(MODE-8):REM FIND GTIA PO
KE
50 RESTORE 1000
60 FOR I=1536 TO 1549:READ A:POKE I,A:
NEXT I:REM DISPLAY LIST DATA
100 GRAPHICS 8:REM START WITH GRAPHICS
 8 WITH TEXT WINDOW
110 POKE 623,GPRIOR:REM FOOL GTIA INTO
 THINKING IT IS IN GTIA MODE
120 POKE 87,MODE:REM FOOL OS INTO THIN
KING IT IS IN THIS MODE
130 DL=PEEK(560)+PEEK(561)*256:REM STA
RT OF DISPLAY LIST
140 POKE DL+166,143:REM TELL OS WHERE
DLI TAKES PLACE
150 POKE 512,0:POKE 513,6:REM TELL OS
WHERE DLI IS
160 POKE 54286,192:REM ENABLE DLI
170 IF MODE=11 THEN POKE 712,8:REM SEE
 TO COLOURS IN THE DIFFERENT MODES
180 IF MODE=10 THEN POKE 704,0:POKE 70
5,12:POKE 706,38:POKE 708,98:POKE 709,
200:POKE 710,148:POKE 712,250
200 REM DRAW DESIGN
210 FOR I=0 TO 79
220 COLOR I
230 PLOT 0,0:DRAWTO I,159
240 PLOT 79,159:DRAWTO 79-I,0
270 NEXT I
280 ? :? " GRAPHICS MODE ";MODE;" WITH
 TEXT WINDOW"
500 END
1000 DATA 72,169,0,141,10,212,141,27,2
08,141,26,208,104,64
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	6376	20	736	30	3684
40	2561	50	841	60	4274
100	3859	110	4358	120	4013
130	3505	140	3331	150	3058
160	1912	170	4680	180	6243
200	2847	210	856	220	541
230	1417	240	1651	270	474
280	3159	500	294	1000	2859

Demo IV

```
10 REM DEMO 5  :  1   ROW  GR.2
                112 ROWS GR.15
                  8  ROWS GR.0
100 GRAPHICS 15+16:REM START WITH MODE
 REQUIRING MOST MEMORY
110 DL=PEEK(560)+PEEK(561)*256
120 POKE DL+3,64+7:REM 1 LINE GR.2
130 LO1=PEEK(88):HI1=PEEK(89):REM FIND
 START OF SCREEN MEMORY AND STORE
140 LO2=LO1+120:HI2=HI1:IF LO2>255 THE
N LO2=LO2-256:HI2=HI2+1:REM NEW START
OF SCREEN MEMORY FOR GR.15 BLOCK
150 POKE DL+6,14+64:POKE DL+7,LO2:POKE
 DL+8,HI2:REM TELL DL WHERE GR.15 SCRE
EN MEMORY IS
160 H=INT(4800/256):L=4800-H*256:REM 1
12 LINES OF GR.15 NEEDS 112*40 BYTES
170 LO3=LO2+L:HI3=HI2+H:REM NEW START
OF MEMORY FOR GR.0 BLOCK
180 IF LO3>256 THEN LO3=LO3-256:HI3=HI
3+1:GOTO 180:REM SORT INTO HI & LO BYT
ES
190 POKE DL+122,64+2:POKE DL+123,LO3:P
OKE DL+124,HI3:REM TELL DL WHERE GR.0
BLOCK IS
200 FOR I=125 TO 131:POKE DL+I,2:NEXT
I:REM 7 MORE GR.0 LINES
210 POKE DL+132,65:POKE DL+133,PEEK(56
0):POKE DL+134,PEEK(561):REM NEW END O
F DISPLAY LIST
300 REM DRAW IN GR.2 LINE TOP SCREEN
310 GOSUB 1000:? #6;"  GRAPHICS 2 LINE
"
400 REM DRAW IN GR.8 WINDOW - MIDDLE
410 GOSUB 1100
420 COLOR 2:PLOT 0,0:DRAWTO 159,0:DRAW
TO 159,111:DRAWTO 0,111:DRAWTO 0,0
430 PLOT 0,0:DRAWTO 159,111
500 REM WRITE IN GR.0 TEXT AT BOTTOM
510 GOSUB 1200:? :? "8 LINES OF GRAPHI
CS MODE 0":? :? "BEWARE! THE OS NO LON
GER CHECKS "
520 ? "IF YOU ARE DRAWING OFF THE SCRE
EN!"
999 GOTO 999
1000 POKE 87,2:POKE 88,LO1:POKE 89,HI1
:POSITION 0,0:RETURN :REM GR.2 TOP LI
NE
1100 POKE 87,15:POKE 88,LO2:POKE 89,HI
2:RETURN :REM GR.8 MIDDLE SCREEN
1200 POKE 87,0:POKE 88,LO3:POKE 89,HI3
:POSITION 2,0:RETURN :REM GR.0 BOTTOM
 SCREEN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	15521	100	4048	110	1616
120	1920	130	4659	140	6951
150	5632	160	4350	170	4028
180	4907	190	5210	200	3759
210	5617	300	6150	310	2183
400	6117	410	673	420	4451
430	1498	500	6197	510	5419
520	2563	999	573	1000	6877
1100	7034	1200	7912		

Demo V

The light and soul of the party!



WITH the party season once again imminent, there should be plenty of call for STEPHEN PRINCE's Disco program. With it, your Atari will be the light and soul of the party.

It will display a pattern on the screen which will beat (pulse) in time with music played into the Atari via the 1010 tape recorder.

To use the program simply RUN it, press RESET, RUN again, place your chosen cassette in the tape recorder and press PLAY.

Note that we've printed two different versions of the program, the first a set display and the second random.

It makes use of these memory locations: 53775, 53791, 53807, 53823, 53839, 53855, 53871, 53887, 53903, 53919, 53935, 53951, 53967, 53983, 53999, 54015 which come in gaps of 16, that is 53775 + 16 = 53791.

These locations react differently, depending upon certain things. If you switch on and type in:

```
10 GRAPHICS 0
20 POKE 54018,52
30 A=PEEK(53775) – or any of
   the above locations
40 ? A
50 GOTO 30
```

and then press a key, the value at location 53775 will be 123. If you play sound into the micro, the values will also be 109 and 105. Normally the value will be 127.

If you then press Reset and run the program the values found in the location will be 239 when there is sound of a strong enough level, 251 when a key is pressed and 255 normally.

When you want to use the program press RUN, then Reset. Place a music cassette in the recorder and press Play.

POKE 54018,60 will disable the tape recorder.

Locations 708, 709, 710, 711 are used to control the colours. The following values give the following colours:

0-15	black/white
16-29	red/gold
30-43	orange
44-57	red/orange
58-71	pink/purple
72-85	purple-purple/blue
86-99	purple-purple/blue
100-113	blue
114-127	blue-blue/white
128-141	turquoise
142-155	green/blue
156-169	green
170-183	yellow/green
184-197	orange/green
198-211	orange-orange/white
212-225	orange-green/white
226-239	orange white
240-254	orange white

PROGRAM I STRUCTURE (SET DISPLAY)

10-30	REM statements containing program name, author and magazine.
50	REM statement.
60	Selects Graphics 1 mode.
70	Sets left hand margin parameter to 0.
80	Removes cursor.
100-110	Enable play on data recorder.
200-400	Print Graphics 1 characters.
500-530	Print Graphics 0 characters.
600-640	Set character and text window colours to black.
700-960	Change colours by PEEKing locations and then POKEing locations 708, 709, 710, 711.
1000-1010	Stop colour cycle.
1100-1110	GOTO colour changes.

PROGRAM II STRUCTURE (RANDOM DISPLAY)

10-30	REM statements containing program name, author and magazine.
50	REM statement.
60	Selects Graphics 1 mode.
70	Sets left hand margin parameter to 0.
80	Removes cursor.
100-110	Enable play on data recorder.
200-210	REM statements.
220-230	Variables for printing random Graphics 1 characters.
300-450	See if ?CHR$(CHRCODE) would produce a blank space.
500-510	Print random characters.
600-610	Add 1 to LOOP variable.
700-710	See if enough characters have been printed.
800-810	GOTO random CHR$ code variable.
900-940	Set character and text window colours to black.
1000-1160	Change colours by PEEKing locations and then POKEing locations 708, 709, 710, 711.
1200-1210	Stop colour cycle.
1300-1310	GOTO colour changes.

Disco

Program I

```
10 REM **ATARI DISCO**
20 REM **BY S.D.PRINCE**
30 REM **(ATARI USER)**
50 REM **SET UP SCREEN(MODE ETC)**
60 GRAPHICS 1+16
70 POKE 82,0
80 POKE 752,1
100 REM **ENABLE TAPE RECORDER**
110 POKE 54018,52
200 REM **?GR.1 CHARACTERS**
210 ? #6;"┘◣┘◣┘OXO> <> <OXO┘◣┘◣┘";
220 ? #6;"◣┘◣┘◣XOX<> <>XOX◣┘◣┘◣";
230 ? #6;"◣┘◣┘◣XOX<> <>XOX◣┘◣┘◣";
240 ? #6;"  H  ocsiddisco  H  ";
250 ? #6;" : :iiiiiiiiiii: : ";
260 ? #6;"  H d  issi  d H  ";
270 ? #6;" : :  i icci i  : : ";
280 ? #6;"  H   *sioois*   H  ";
290 ? #6;"(!)(!)#o@oo@o#(!)(!)";
300 ? #6;")!()!(*oo00oo*)!()!(";
310 ? #6;")!()!(*oo00oo*)!()!(";
320 ? #6;"(!)(!)#o@oo@o#(!)(!)";
330 ? #6;"  H   *sioois*   H  ";
340 ? #6;" : :  i icci i  : : ";
350 ? #6;"  H d  issi  d H  ";
360 ? #6;" : :iiiiiiiiiii: : ";
370 ? #6;"  H  ocsiddisco  H  ";
380 ? #6;"◣┘◣┘◣XOX<> <>XOX◣┘◣┘◣";
390 ? #6;"◣┘◣┘◣XOX<> <>XOX◣┘◣┘◣";
400 ? #6;"┘◣┘◣┘OXO> <> <OXO┘◣┘◣┘";
500 REM **?GR.0 CHARACTERS**
510 ? "DISCO█disco DISCODISCO disco█DI
SCO"
520 ?
530 ? "DISCO█disco DISCODISCO disco█DI
SCO"
600 REM **SET COLOURS TO BLACK**
610 POKE 708,0
620 POKE 709,0
630 POKE 710,0
640 POKE 711,0
700 REM **CHANGE COLOURS**
710 IF PEEK(53775)=239 THEN POKE 708,4
0
720 IF PEEK(53791)=239 THEN POKE 709,2
02
730 IF PEEK(53807)=239 THEN POKE 710,1
48
740 IF PEEK(53823)=239 THEN POKE 711,7
0
750 IF PEEK(53839)=239 THEN POKE 708,4
0
860 IF PEEK(53855)=239 THEN POKE 709,2
870 IF PEEK(53871)=239 THEN POKE 710,1
48
880 IF PEEK(53887)=239 THEN POKE 711,7
0
890 IF PEEK(53903)=239 THEN POKE 708,0
900 IF PEEK(53919)=239 THEN POKE 709,0
910 IF PEEK(53935)=239 THEN POKE 710,0
920 IF PEEK(53951)=239 THEN POKE 711,0
930 IF PEEK(53967)=239 THEN POKE 708,2
55
940 IF PEEK(53983)=239 THEN POKE 709,2
55
950 IF PEEK(53999)=239 THEN POKE 710,2
55
960 IF PEEK(54015)=239 THEN POKE 711,2
55
1000 REM **STOP COLOUR CYCLE**
1010 POKE 77,0
1100 REM **GOTO COLOUR CHANGES**
1110 GOTO 710
```

Get it right!

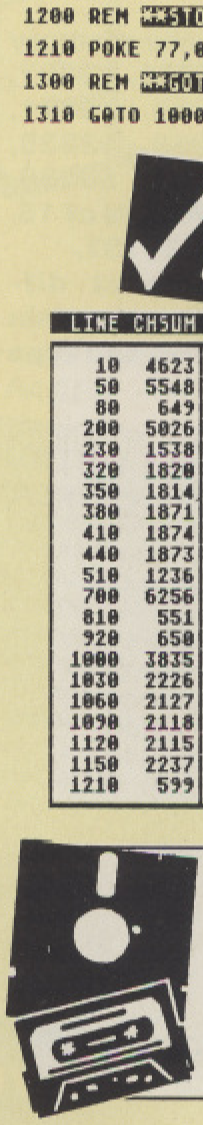
LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3211	20	3578	30	3370
50	5548	60	892	70	595
80	649	100	5000	110	812
200	4174	210	2049	220	2081
230	2081	240	3227	250	3643
260	2423	270	2425	280	2721
290	3703	300	3741	310	3741
320	3703	330	2721	340	2425
350	2423	360	3643	370	3227
380	2081	390	2081	400	2049
500	4173	510	4770	520	133
530	4770	600	5012	610	649
620	650	630	642	640	643
700	3835	710	2178	720	2227
730	2226	740	2169	750	2179
860	2127	870	2227	880	2179
890	2118	900	2126	910	2116
920	2115	930	2239	940	2238
950	2237	960	2218	1000	4450
1010	599	1100	4835	1110	554

Program II

```
10 REM **ATARI(RANDOM)DISCO**
20 REM **BY STEPHEN PRINCE**
30 REM **(ATARI USER)**
50 REM **SET UP SCREEN(MODE ETC)**
60 GRAPHICS 1+16
70 POKE 82,0
80 POKE 752,1
100 REM **ENABLE TAPE RECORDER**
110 POKE 54018,52
200 REM **VARIABLES FOR RANDOM**
210 REM **   GR.1 CHARACTERS   **
220 LOOPS=0
230 CHRCODE=INT(RND(0)*255)
300 REM **IS CHRCODE A SPACE ETC**
310 IF CHRCODE=27 THEN GOTO 230
320 IF CHRCODE=28 THEN GOTO 230
330 IF CHRCODE=29 THEN GOTO 230
340 IF CHRCODE=30 THEN GOTO 230
350 IF CHRCODE=31 THEN GOTO 230
360 IF CHRCODE=32 THEN GOTO 230
370 IF CHRCODE=125 THEN GOTO 230
380 IF CHRCODE=126 THEN GOTO 230
390 IF CHRCODE=127 THEN GOTO 230
400 IF CHRCODE=155 THEN GOTO 230
410 IF CHRCODE=156 THEN GOTO 230
420 IF CHRCODE=157 THEN GOTO 230
430 IF CHRCODE=159 THEN GOTO 230
440 IF CHRCODE=254 THEN GOTO 230
450 IF CHRCODE=255 THEN GOTO 230
500 REM **?GR.1 CHARACTERS**
510 ? #6;CHR$(CHRCODE);
600 REM **ADD 1 TO LOOP**
610 LOOP=LOOP+1
700 REM **PRINTED ENOUGH CHARACTERS?**
710 IF LOOP=400 THEN GOTO 900
800 REM **GOTO RANDOM CHR$ CODE**
810 GOTO 230
900 REM **SET COLOURS TO BLACK**
910 POKE 708,0
920 POKE 709,0
930 POKE 710,0
940 POKE 711,0
1000 REM **CHANGE COLOURS**
1010 IF PEEK(53775)=239 THEN POKE 708,
40
1020 IF PEEK(53791)=239 THEN POKE 709,
202
1030 IF PEEK(53807)=239 THEN POKE 710,
148
1040 IF PEEK(53823)=239 THEN POKE 711,
70
1050 IF PEEK(53839)=239 THEN POKE 708,
40
1060 IF PEEK(53855)=239 THEN POKE 709,
2
1070 IF PEEK(53871)=239 THEN POKE 710,
148
1080 IF PEEK(53887)=239 THEN POKE 711,
70
1090 IF PEEK(53903)=239 THEN POKE 708,
0
1100 IF PEEK(53919)=239 THEN POKE 709,
0
1110 IF PEEK(53935)=239 THEN POKE 710,
0
1120 IF PEEK(53951)=239 THEN POKE 711,
0
1130 IF PEEK(53967)=239 THEN POKE 708,
255
1140 IF PEEK(53983)=239 THEN POKE 709,
255
1150 IF PEEK(53999)=239 THEN POKE 710,
255
1160 IF PEEK(54015)=239 THEN POKE 711,
255
1200 REM **STOP COLOUR CYCLE**
1210 POKE 77,0
1300 REM **GOTO COLOUR CHANGES**
1310 GOTO 1000
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	4623	20	4427	30	3370
50	5548	60	892	70	595
80	649	100	5000	110	812
200	5026	210	4793	220	559
230	1538	300	5316	310	1819
320	1820	330	1821	340	1813
350	1814	360	1815	370	1870
380	1871	390	1872	400	1873
410	1874	420	1875	430	1877
440	1873	450	1874	500	4174
510	1236	600	3522	610	846
700	6256	710	1671	800	5148
810	551	900	5012	910	649
920	650	930	642	940	643
1000	3835	1010	2178	1020	2227
1030	2226	1040	2169	1050	2179
1060	2127	1070	2227	1080	2179
1090	2118	1100	2126	1110	2116
1120	2115	1130	2239	1140	2238
1150	2237	1160	2218	1200	4450
1210	599	1300	4835	1310	600



Tired of typing?

Take advantage of our finger-saving offer on Page 69.

Those special characters

RECENTLY we've had several enquiries about how to produce the "special" characters which sometimes appear in our listings. It's because of this uncertainty that we prefer authors not to use such characters.

However, we recognise that sometimes it's the simplest way and occasionally it's the only way of doing something. For this reason we're printing the two tables below. These show how to produce the special characters from the keyboard.

We've drawn a box around the characters so that you can see their position more clearly. These boxes won't appear either on-screen or in the listings we print.

The Control and Shift keys are used by holding them down while you press another key. For example, if you read CTRL A, you hold down the CTRL(CONTROL on XL machines) key and press A.

The ESC key is like a normal key, simply press it. For example, if you read ESC DELETE, you press and release the ESC key and then press and release the DELETE key.

The Reverse Video Mode key has been abbreviated to REV. On early machines this key bore the Atari logo , while on XL machines it has a design on it. If this key is pressed and released once, all subsequent input will appear in reverse (or inverse) on the screen. You turn Reverse Video Mode off by pressing the key again.

For example, if you read REV CTRL P the sequence of operations would be:

1. *Press and release REV key to turn on Reverse Video Mode.*
2. *Hold down CTRL key and press and release P key.*
3. *Release CTRL key.*
4. *Press and release REV key to turn off Reverse Video Mode.*

It's easy to make mistakes with the special characters, which is why we prefer not to use them. If you do use them, take extra care.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL -
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O	|	SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

REVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	REV CTRL ,		REV CTRL S
	REV CTRL A		REV CTRL T
	REV CTRL B		REV CTRL U
	REV CTRL C		REV CTRL V
	REV CTRL D		REV CTRL W
	REV CTRL E		REV CTRL X
	REV CTRL F		REV CTRL Y
	REV CTRL G		REV CTRL Z
	REV CTRL H		ESC SHIFT DELETE
	REV CTRL I		ESC SHIFT INSERT
	REV CTRL J		ESC CTRL TAB
	REV CTRL K		ESC SHIFT TAB
	REV CTRL L		REV CTRL .
	REV CTRL M		REV CTRL ;
	REV CTRL N		REV SHIFT =
	REV CTRL O		ESC CTRL 2
	REV CTRL P		ESC CTRL DELETE
	REV CTRL Q		ESC CTRL INSERT
	REV CTRL R		

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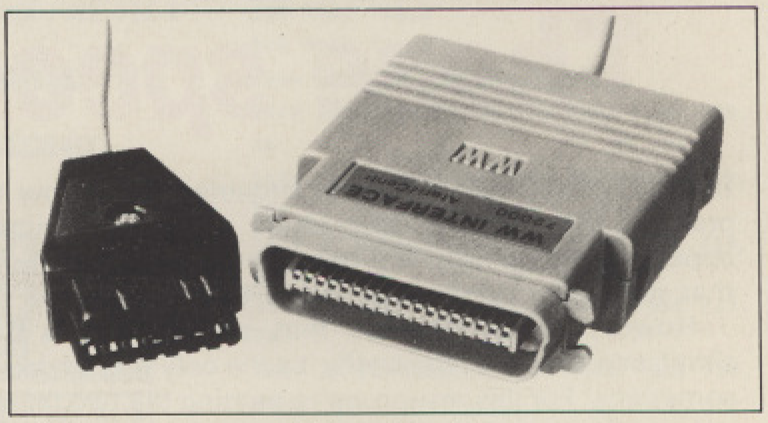
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Basic XL

A WOLF IN SHEEP'S CLOTHING?

STEPHEN DONOGHUE puts an extended Basic language package through its paces

HAVE you ever felt left out in the cold when it comes to Basic programming on your Atari, especially when you compare it to the Amstrad and BBC Micro models?

Well there's no need to hang your head in shame any longer. With the aid of Optimized Systems Software's Basic XL you too can turbocharge your Atari.

Basic XL is an alternative Basic to the one you were supplied with by Atari, either in ROM form for the 400/800 series, or built in on the XL/XE series.

Since Atari Basic was written by OSS in the first place, you can be sure that Basic XL is fully compatible with any programs you already have. But more about that later.

As supplied, Basic XL comes as a bright orange ROM cartridge, complemented by a beautifully-produced A5 yellow ring binder containing more than 300 pages of information about the software.

The manual is split into two parts. The first section, and also the largest, is a comprehensive tutorial on how to program in Basic for the complete novice upwards. The second half of the manual details each of the commands available with Basic XL.

When you think of the appalling documentation supplied with the XL machines, the manual supplied by OSS is welcome news indeed.

As for the ROM cartridge, it's really a wolf in sheep's clothing.

Basic XL is a full blown 16k ROM, but because of clever software and hardware engineering inside the cartridge, your Atari only loses 8k of RAM when installed. In other words, you get the benefit of 16k Basic, taking up no more memory than the standard Atari 8k Basic.

Truly a case of squeezing a quart into a pint pot.

So what's special about Basic XL? Well you get 45 extra commands not included in Atari Basic for a start. If you're a disc user I bet there's been many a time you've cursed not been able to find out what files are on your disc without having to go into the DOS menu.

With Basic XL all the commands to list a directory, lock and unlock files, rename files and delete files from disc are all there at your fingertips.

The ability to do those on their own is worth the purchase of the cartridge in itself.

Still not convinced? Read on. Basic XL doesn't give a hoot about how you type in your commands. It will quite happily accept lower case, inverse video, or any combination of typing style that suits you, all without

> **' . . . you too can turbocharge your Atari '**

throwing your lines of Basic program out as syntax errors.

When you list your program, Basic XL has converted the text into normal video with variables beginning with capital letters, and the remaining letters in lower case. Not only that, but all FOR . . . NEXT loops are indented for ease of reading.

Program logic is more controlled. Besides IF . . . THEN statements, we also have IF . . . ELSE . . . ENDIF, and WHILE . . . ENDWHILE statements to play with.

The string statements, LEFT$, RIGHT$, MID$, are supported, as well as the normal Atari sub-string commands.

String arrays are supported, and if you intend to use a string variable in your program and its length will not exceed 40 characters, there is no need to DIMension it beforehand.

Player/Missile commands direct from Basic are there to be explored.

I'd never bothered with player graphics before, mainly due to the enormous amount of work needed to create the shape, place it in memory, then animate it.

With no prior knowledge of player/missile graphics, I picked up

the manual and within 15 minutes I had a spaceship whizzing around the screen under joystick control. It's that easy.

While we're on the subject of joysticks, besides the normal STICK command, we also have HSTICK and VSTICK. These commands sense only the horizontal and vertical motions of the joystick respectively, and help simplify controlling movement.

How many times have you written or had use of a program that requests

> **. . . the benefit of 16k ROM for no more memory than standard Atari 8k**

user input, and wish that irritating ? would disappear, or better still, replace it with something more useful? Once again, Basic XL has the answer.

Using one of the 13 SET commands, you can have any character you like as the prompt to an INPUT statement, or if you desire, no character at all.

Other SET commands allow you to disable the Break key, set TAB stops for the comma in Print statements, choose how your program looks when it is LISTed, and decide whether you wish just error numbers to appear when you make a mistake, or to have printed a short message explaining the error as well.

One other command that proves useful is MOVE which can copy blocks of memory at machine code speed.

If you've ever re-defined a character set, you know that every character has to be moved byte by byte from ROM into RAM where you can then alter the characters to suit your needs.

I wrote a program to compare the two methods and Basic XL was about 57 times faster than its Atari counterpart.

For program development you can have automatic line numbering, line re-numbering and block deletion of lines.

If your program has a bug in it you can use the TRACE command which lets you see at which line number the program is currently. If that's not enough, you can also list to the screen or printer every variable and string variable used in your program, and what lines they were referenced on with the LVAR command.

My favourite, and the one I've kept until last, is the FAST command. As it's name implies, that's just what it does.

Make FAST the first line of your program, and things really begin to move. In general, Basic XL runs about 20 per cent faster than Atari Basic when running standard benchtest programs.

But that doesn't tell the whole story. If you understand anything about the way Basic works you'll know that it is an interpretive language. By that I mean it has to translate into machine code each and every line of your program at run time.

Not only that, every time a GOTO or GOSUB statement is executed, in order to find the target line referenced Basic must read all the line numbers from the beginning of the program to find out where it has to go.

This is one of the main reasons that Basic is so slow, and also why Basic programmers keep all their frequently called subroutines at the beginning of

> **. . . with no prior knowledge of graphics I had a spaceship whizzing around within 15 minutes**

the program. That way, Basic finds its way around much quicker.

What the FAST command does is pre-compile every line number called in a GOTO, GOSUB, TRAP statement and so forth. When the program is running each target line is found instantly.

To give an example, I wrote a Basic program for my eight-year-old niece which helped her with simple addition, subtraction and multiplication sums.

The program made extensive use of the Atari's graphics 18 mode, and was made up almost entirely of subroutines.

By the time the program was de-bugged and fully functional it was nearly 20k long.

As an afterthought, I decided to add another subroutine which made a nice presentation screen for the beginning of the program. Having nowhere else to put it, this subroutine

> **Basic XL is about 57 times faster than its Atari counterpart**

was at the very end of the program, and was the first one called.

By use of the FAST command the opening screen appeared almost instantly and ran smoothly as I designed it to be.

As an experiment I timed the opening subroutine to see how long it would take to execute with the FAST command removed from Basic XL. The difference was very noticeable – Basic XL took 20 times longer to execute the subroutine.

In other words, without this unique command my program could not run as I intended without a major re-write.

That covers some of the new commands of Basic XL. There are a whole lot more I haven't even attempted to describe, but are just as much fun to use.

Furthermore, if OSS's DOS XL is used in conjunction with Basic XL, some very interesting, and useful, new features come into play. But that's another story.

So is Basic XL worth buying? At a price of £75 or so, it's almost the cost of an Atari 800XL.

However you do get a powerful Basic which is more friendly and if you're new to the programming game, the accompanying manual is an immense help.

As for compatibility, 95 per cent of your programs will still run – but faster.

Don't forget, Basic XL was made to be compatible with Atari Basic, *not* the other way around.

With all those wonderful new commands at your disposal, who wants to use old fashioned Atari Basic anyway?

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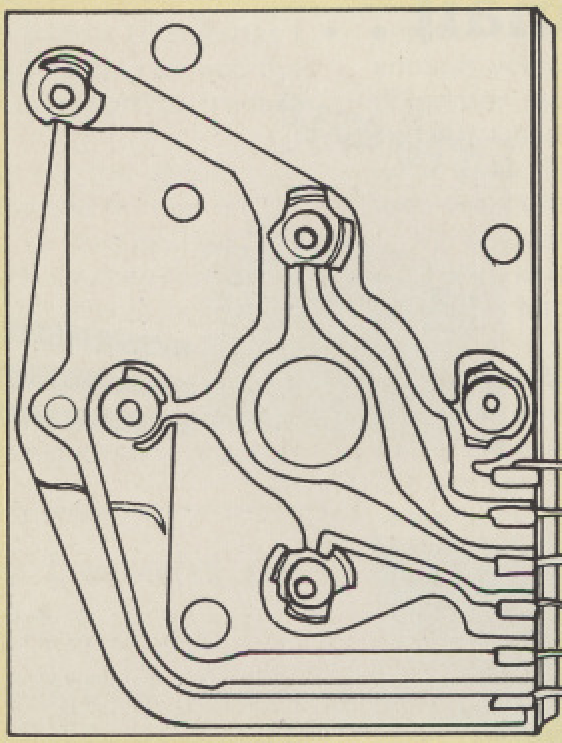
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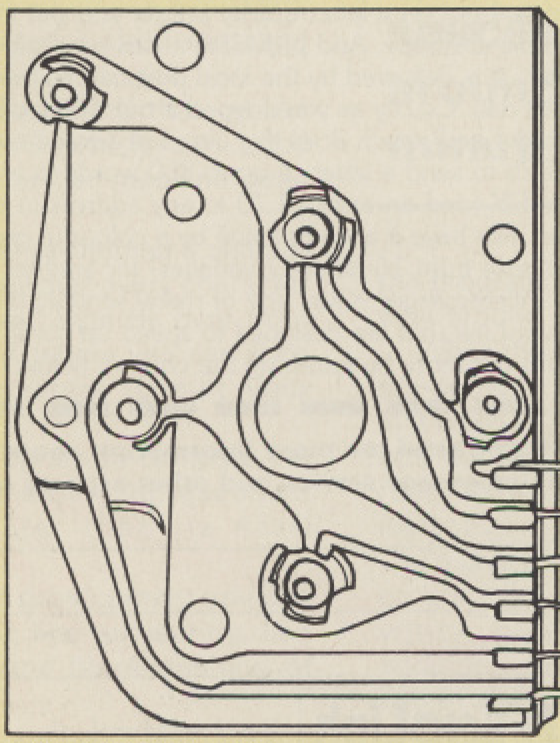
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The original wiring

Left-handed? Then stop right here...



The left-handed wiring

HAVE you noticed how many "lefties" there are these days? No, I don't mean the sort that the Tory party rail against, I mean left-handed people.

Joystick manufacturers seem largely to ignore the problems which face left-handed users of right-handed joysticks, and the Atari joystick is no exception.

The normal playing position puts the firing button on the left and the player moves the joystick with the right hand.

This means that lefties have to use their stronger hand to push the button and their weaker hand to move the stick.

This is great if you're playing a left-handed person in competition, but not so great if you happen to be that left-handed person.

If you have an Atari joystick, it can easily be converted for left-handed use as follows:

Open the joystick by removing the four screws from the bottom and pulling the top off. In the base you'll find a printed circuit board with six wires attached.

In fact there are two types of board – the type we've shown here with all six wires on one side, and another type with three wires on each side. In fact, it doesn't matter which type you have because they follow the same colour coding.

Make the wiring changes by unclipping the wires from the circuit board and clipping them into the new positions. They should just pull off and push on the board with no problem.

When you've got the wires in the new positions, screw the whole thing back together and ignore the word "Top" that's embossed into the case.

Simply hold the joystick so that the firing button is on the right-hand side and move the stick in the normal way.

There you have it – a left-handed joystick.

It will improve your performance and cause no end of confusion for your right-handed chums!

Business package can roll out the £s

RECENTLY I bought what was described as a business package consisting of an 800XL computer, a 1050 disc drive, a 1027 printer, Visicalc and AtariWriter.

At the time it seemed an excellent bargain, and it turned out to be very good value, particularly the printer.

However there was one snag.

The AtariWriter program came on a disc, the reverse side of which printed the manual.

This contained no mention of the international characters, which include the English pound sign, which is essential for business purposes.

I learned that the cartridge version of this program includes control commands which produce all the international characters. For example Ctrl-O8 produces the pound sign, but this does not work with the disc.

Is the disc version an inferior program, or does it have commands for the pound sign and other international characters available but not published? – **G.O. Dubourg, Mansfield.**

● The disc version of AtariWriter does have the feature you mentioned, but in order to use a pound sign, which is Control-O followed by 8, as you say, you must first set the printer to use the international character set.

This is the printer's equivalent of POKE 756,204 for the screen.

To do this use Control-O, followed by 27, then Control-O and 23.

Once you have done this you can print any of the international characters listed in the book.

These codes apply equally to the cartridge and disc versions of AtariWriter, and are the equivalent to LPRINTing the key sequence: ESC ESC W.

Missing some games

I OWN an 800XL, but before that I had the 2600 VCS and some of the games, for example Starmaster by Activision, were good games but are not available for the home computer.

Why is this so? After all they did it with River Raid, which is also a good game.

Is there some problem with putting them on cassette, disc or another cartridge? – **B. Lloyd, Brighton.**

● Not all games from all companies are brought out for all computers. The only way to get companies to bring out titles for the Atari is to make them know you want them.

You can do that in two ways. Firstly write to them, and get your friends to do the same, telling them how many copies they'd sell if they did release it.

The second, more general, point is this. When they do release a game you like, buy it, don't accept a copy of it.

The last thing a company is prepared to do is specially commission a game to be written costing tens of thousands of pounds then have it ripped off left, right and centre.

Help in the manual

IT was with much interest that I read the letter by R.B. Moss, in September's Mailbag. I too had suffered the same problem with my printer and Home Filing Manager.

My printer is a Star Micronics SG-10, and I found upon further reading of the manual that it has the capability of 7 or 8 bit operation from software control.

So a simple LPRINT statement sets up the printer. Then boot Home Filing Manager and no more weird characters.

The SG-10 is Star's replacement for their Gemini 10X, one that many Atari owners will have heard of if they have access to the American magazines Antic and Analog.

I would enter one plea to Star Micronics. As they now produce the SG-10C, a Commodore compatible version of the SG-10, how about an Atari compatible version? That is, one that requires no separate interface.

It's too late for me, but I am sure it would boost their sales to Atari owners.

Finally, thanks to Atari User *and R.B. Moss for the letter which prompted me to read my printer manual again. I have found several useful tips in Mailbag.* – **Bruce Allen, Burton-on-Trent.**

Check it again

I WROTE to you a couple of days ago regarding the Maze Munch game, and my difficulty in getting it to work properly.

Well, having decided to take the advice you always give to other readers, I checked my typing by typing "LIST 10 – LIST 20 etc" through the complete program, and found nothing wrong.

So I did the same again. Nothing. After doing this four (4) times, I eventually found a letter O where there should have been a number 0. And

→

Interfacing to a printer

I HAVE recently bought an Atari 800XL and wish to interface it to other equipment, in particular a Tandy line printer VII.

However I cannot find any reference to the pin configurations of either the serial or parallel ports in either the Atari manual or any books available locally in the shops.

I would be grateful if you could publish this information for the benefit of myself and other users interested in the more technical side of Atari computing. – **C.L. Durkin, Huddersfield.**

● In order to interface a serial printer to the Atari you will need an RS-232 interface. The best is Atari's 850 module, but these are now very difficult to obtain.

If you find one – buy it! Otherwise a number of companies are bringing out their own modules, but we have not yet seen one on sale.

If you are very technically minded, you could try to design your own interface via the joystick ports.

However unless you are an experienced machine code programmer with a fairly good knowledge of electronics, our advice is: Don't even think about it.

Antic magazine (Vol. 3/9 to 3/12) carried a series of articles about developing a serial interface for the PBI bus connector at the back of the XL computers.

now the game runs perfectly.

As I said in my earlier letter, I have owned my 800XL only two weeks. Before taking the plunge I thought you had to be some kind of whizz kid to use a computer.

All I can say now to all those new owners or potential purchasers of Atari equipment is go ahead and do it, don't buy games, type them yourself from Atari User, join your local group, but most of all, if you make a mistake, CHECK YOUR TYPING!

Look for silly mistakes, not obvious ones. It will all be worth while in the end. I have just finished typing in Raider 1997 from the August Atari User *and, although I don't really like the game – probably because I keep getting killed as a spy – I typed it with NO errors.*

I don't expect to do this every time, but at least I know that all that checking is so very worth while. – **Peter Hunter, Norwich.**

DOS disc directory reader

HERE is a short program which will come in handy for any Atari owners who use a disc drive and Basic.

It reads the directory from a DOS disc and prints all the filenames to the screen (2 on each line).

IOCB stands for input/output control block. – **Chris Porter, Isleworth.**

```
10 DIM A$(20)
20 OPEN #1,6,0,"D:*.*":REM SET UP IOCB
 TO READ DIRECTORY
30 TRAP 60:INPUT #1,A$:REM READ 1 FILE
NAME FROM DISK & CHECK TO SEE IF IT IS
 THE LAST
40 ? A$;"  ";:REM 2 SPACES
50 GOTO 30
60 CLOSE #1:REM CLOSE IOCB
70 END
```

Math pack lock-up

I HAVE found on a few occasions that while entering a program into my 600XL the computer will go faulty.

It doesn't print any characters on the screen and does not carry out any instruction I give it.

However when I press Reset the computer prints READY and lets me type things in. But as soon as I press the Return key I can't input anything again. – **Richard E. Newbould, Harrogate.**

★ ★ ★

I HAVE tried to program the Alphabet Train from your first issue on my 800XL. When I reach the end of line 490 the computer no longer responds to any key pressed, apart from Reset.

This of course, clears the screen but then after typing LIST or RUN the same thing occurs. The keyboard gives no response to any combination of keys pressed.

This problem is most frustrating as there is no error I can correct and it results in the loss of many hours typing. – **D.J. Sharratt, Wolverhampton.**

● I sounds as though you both have a computer with the infamous math pack lock-up.

This is due to a small problem with timing on the Atari 6502 chip, we gather, and can be easily fixed by replacing that chip with one of the newer versions.

Consult your dealer and if it's still under guarantee they should replace the computer.

If anyone gets a similar problem with an old Atari 400/800 the solution is even easier. The problem in your case is a bug in the Basic cartridge.

If you replace this with a Revision C cartridge you'll get no more lock-ups.

Moving pictures

WHEN I got my 800XL I only had a black and white TV to use it on.

Every so often I had to re-tune the channel because of the picture moving about. I thought it was my TV and took no notice.

Recently I bought a new colour TV and the picture still keeps moving. It is most aggravating. Could you please tell me why it does this. – **Matthew Kemp, Farnborough.**

● You could have a faulty modulator in your computer, or the TV tuners could be at fault.

Generally the cheaper TVs don't lock on to a signal as well as the more expensive ones.

Also, the computer signal could well be drifting as it gets warm.

Perhaps you should consider taking your computer back to your dealer, or better still contacting Atari's Service Department in Slough.

User group sought

I'VE been trying to make contact with a user group. I've written to Elmbridge Computer Club at Walton-on-Thames and a Mr Adrian Miles in Wallington, Surrey, enclosing an sae but have received no reply from either.

I can only think that both groups no longer exist. I phoned Atari Helpline, but they could suggest no other groups, so perhaps you or your readers may know of a local group. – **P.D. Little, Carshalton.**

● You've tried the only two addresses *we* have in that area. Perhaps one of our readers has up-to-date information.

Special interests

I AM starting a special interest group for Atari computer users which will concentrate on matters other than games – music, robotics, computer art and other specialist activities.

The idea is to promote the more serious applications of Atari home computers.

The group will initially offer two main services, a newsletter/magazine and a contact service.

Members wishing to produce an article for publication will not have it refused on the grounds that it is of a too specialized nature. The contact service is for members who wish to exchange ideas with other members.

If the basis of the ideas for the layout and programme of the group appeals to your readers I invite them to write to me enclosing a sae for an application form. – **G. Leader, 143 Richmond Road, Leytonstone, London E11 4BT.**

★ ★ ★

COULD you please tell me the closest club to Kilmarnock. – **Damian McCluskey, Kilmarnock.**

● There is a Glasgow group. Contact Mr Fletcher c/o 11/4 27 Castlebay Drive, Milton, Glasgow. As far as we know, that's the nearest to you.

Plea from Poland

I BOUGHT an Atari 800XL cassette starter pack and No 1 Atari User *magazine in London last month.*

The pack contains the Pole Position game, which appears to be defective.

When I start to load after 15 seconds loading sound I hear "beep" and the cursor disappears. I can see "!" in the right bottom corner at the same time. The tape is rolling but I

don't hear a loading sound.

After another 10 seconds the loading sound is heard once again.

Other software, and the Atari Demo, which is on the other side of the cassette, works very well.

I am a beginner in micros, so I'm very interested in your exciting magazine Atari User.

Would you like to advise me if there is any possibility of getting other copies, because in Poland there isn't any Atari service or magazine. – **M Witold, Gliwice, Poland.**

● You will probably find that the game is still loading quite correctly. The pause is simply while the computer checks that the memory is OK to run Pole Position, then the rest of the game loads into memory.

Leave it for about five minutes after the "!" appears, and you should be racing.

Many magazines and software/hardware items are available by mail-order to anywhere in the world. Why not try Silica Shop or Software Express, or one of our other advertisers?

You could also contact some of your own computer stores in Poland, and complain about the lack of Atari products!

Alternative inputs

COMPUTERS can produce visual and printed output, so wouldn't it be nice if they could accept visual, printed and even spoken input?

I would like to develop software to allow my 800XL to "see", "hear", speak and read and hope that you can provide the name of a company which makes visual and audio digitisers, voice synthesisers and optical character readers, compatible with the Atari. – **N. Williamson, Leighton Buzzard.**

● The sort of items you ask about are available for many machines, but software is up to you, I'm afraid. You also will be talking of thousands of pounds worth of equipment.

The best way to connect such units to an Atari are via the RS-232 port on the 850 module. Alternatively, use the joystick ports as simple parallel or 1-bit input/output ports to custom designed devices.

Try contacting any company advertising such devices for other machines to see if they would be RS-232 compatible.

Board open for calls

I AM writing to you on behalf of the Birmingham User Group, which has recently opened up a new bulletin board, the Central Birmingham Atari Bulletin Board Service. Our phone number is 021-430 3761.

The board runs 24 hours a day, closed only on a Thursday, reopening again on Friday at 1800 hours. — **Mick Coleman, sysop, Birmingham.**

Lightweight handbook

I BOUGHT an Atari 800XL and a 1050 disc drive in the hope of writing programs that would be able to use data stored on disc by another program which accepted INPUT data, made certain checks on it and then write the valid data to a file.

This originating program would be run on several occasions before the secondary program was required.

The handbooks I received with the computer and disc drive give me next to no information on writing data to and reading data from disc and into programs.

Please could you advise me whether or not this can be done and also recommend a reference book on the subject. – **M.C. Powell, Bristol.**

● You're right. The handbooks provided with the 800XL are, shall we say, a little lightweight. The program which you outline is, of course, very simple to write given the right information.

Basic uses the normal INPUT and PRINT commands, but you will also need to know how to use OPEN, probably with both normal and random access files.

The best book for this sort of information is "Your Atari Computer", from Osborne/McGraw Hill.

This covers Basic from first steps right up to some complex graphics facilities and complex I/O control, which is what you want.

It doesn't come cheap – about £17 – but it's worth every penny.

If you can't get one from your local stores try one of our mail order advertisers. Don't forget to ask for the updated version, which has some extra information regarding the XL range.

Lost in the maze

I HAVE a niggle about the game in the September Atari User, Maze Munch – I can't get it to work.

I get "Error 8 at line 9006". I looked this up in my manual to find that it is an Input statement Error – "the user attempted to input a non-numeric value into a numeric variable".

Can you help me clear this up? – **P.R. Hann, Leigh-on-Sea.**

● Check your listing! If you can't stand to check it again, see the cassette offer on Page 61.

Program provided

I WISH to write a small auto-run program that will load a Basic program which will be a menu to load more Basic programs.

I hope to be able to boot straight in to my Atari 800. I have a 1050 disc drive. – **A.J. Lowe, Leigh on Sea.**

● The DOS 2.5 disc has a program on it which does what you want! See the order form at the back of this magazine to send off for your copy if you haven't yet got one.

Copying programs

I OWN an Atari 800 and Indus GT, disc drive. I don't mind buying software but what I do mind is the chance of a speck of dust sending £15 hard earned cash down the drain.

Any respectable disc drive owner would make a back up of such programs and I would if I could, but the programs are protected.

So could you possibly

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

review some copying programs?

Also, I am considering buying a printer, so a printer review would be useful. – **Parvin Bangal, Hartlepool.**

● You have raised one of the most debated points in the software industry. Because of the danger of misuse and impending legislation, we will not be publishing any reviews or adverts of products designed primarily for copying software.

You have raised a valid point regarding personal back-ups of software, but until the public can be trusted not to pirate software by copying it illegally for their friends, such protection will not only remain, but become more complex.

There are devices which can copy protected software – none of which will fit an Indus GT – but due to the possibility of misuse, they are not generally imported into the country.

If you accidentally damage a disc or cassette which is protected, the company who make the program should provide you with a replacement at nominal cost providing you send them the faulty disc and a copy of your receipt.

Substitute for string arrays

I'VE written a database program for my T199/4A which involves string arrays and I would like to convert it for use on my 800XL.

The problem is, how to get string arrays in Basic. The format would be in a similar manner to this, but with a different approach:

```
10 DIM A$(1000)
20 INPUT A$ (COUNTER)
30 LET COUNTER =
   COUNTER+1
40 GOTO 20
```

– **David Stockton, Northwich.**

● Atari Basic does not have string arrays as such, but it does have "long strings", and "sub-strings" which can be used to the same end.

A long string is simply a string set up for thousands of characters long – like the whole of an array.

A sub-string is a portion of any string, accessed by using two numbers in brackets after the string name.

For example, A$(10,40) would mean a smaller string than A$, containing everything from character 10 to character 40 of A$.

These two features can be put together to write our own string array routines.

Let's say we want to DIM a simulated string array for up to MAX items, each of up to SIZE characters long.

Let's use ITEM to indicate which element we're talking about (B$ will be a temporary holding string).

First, you must DIM the string with:

```
DIM A$(MAX*SIZE),
    B$(SIZE)
```

Then, fill it with spaces:

```
A$(1)=" ":A$(MAX
 *SIZE)=" ":A$(2)=A$
```

To set element ITEM in our 'Array", use:

```
INPUT B$
A$((ITEM-1)*SIZE
+1,ITEM*SIZE)=B$
```

To read element ITEM back again, use:

```
B$=A$((ITEM-1)*
   SIZE+1,ITEM*SIZE)
```

Thus, your example (assuming up to 40 characters per item) becomes:

```
10 DIM A$(1000*40), B$(40)
20 A$(1)=" ": A$(1000*40)=" ":A$(2)=A$
30 INPUT B$: A$((COUNTER-1)*40+1,
   COUNTER*40)=B$
40 LET COUNTER=COUNTER+1
50 GOTO 20
```

This is a little more complex than the TI version, but it does the job. Basic-XL, Microsoft Basic, etc., all have string array operations built in, so this technique becomes redundant when using any of these languages. – **André Willey.**

Running Hexer on 16k

COULD you please tell me whether your Hexer program and the subsequent random number program will run on an Atari 400 in 16k?

I have tried a number of times, only for the program to crash after printing very few random numbers.

I would also like to know if the listings printed in your brilliant magazine – Bomb Run and Frog Jump – are suitable for my relic from Atari's past as I have had problems with character defining.

Another thing I would like to know is if my computer can be upgraded with more memory, and if so, how high can I go?

Congratulations on a very good magazine, only one suggestion I would make, however. How about telling us poor folk with smaller machines how much memory is needed per listing? – **G. Davidson, Newcastle upon Tyne.**

● Most listings we print are for more than 16k, I'm afraid. Hexer will run on a 16k machine, but its default address of $4000 will not be useable, since that is actually beyond your machine's RAM capacity. Try using $3000 instead.

Since the random numbers program is assembled at $4000, it will not run on a 16k machine as printed, and would need to be modified byte-by-byte by a machine code programmer in order to work.

Just changing the start address won't make it run, unfortunately.

You can upgrade a 400 to a full 48k, but you may find it difficult to get the upgrade board these days. Try the major mail order companies, or a local Atari specialist.

Fitting is internal, and requires soldering on to the computer's motherboard, so should not be attempted by the novice.

Memory update

I HAVE a 600XL and wish to upgrade the memory. Where can I get one, and how much will it cost for a RAM pack to upgrade to 48k?

Where can I get and at what price a book explaining as fully as possible the POKE commands?

How do you reload a program listed to cassette using LIST "C:'?" I have tried everything and just keep getting "ERROR 21"

– **Ian Brooker, Poole, Dorset.**

● On the first two points, try Silica Shop or try ringing some of our advertisers – they can't include everything in their ads.

The book you might like to investigate is "Mapping the Atari" by Ian Chadwick at a cost of around £15.

To re-load a LISTed program, try ENTER "C:"

Monitor

IN the October issue of Atari User *you published a letter from Mr Dunstan of Cornwall who was complaining that after he had purchased an 800XL from Silica Shop and joined their user's club he received no information or news-sheet from them and neither did his brother.*

In the reply to this letter, you stated that the Atari Owners Monitor is only published quarterly.

I would like to clarify some points here. First, Monitor is a magazine published by the UK Atari Computer Owners Club every quarter and has no association with Silica Shop.

The Club is an independent organisation set up in 1979

→

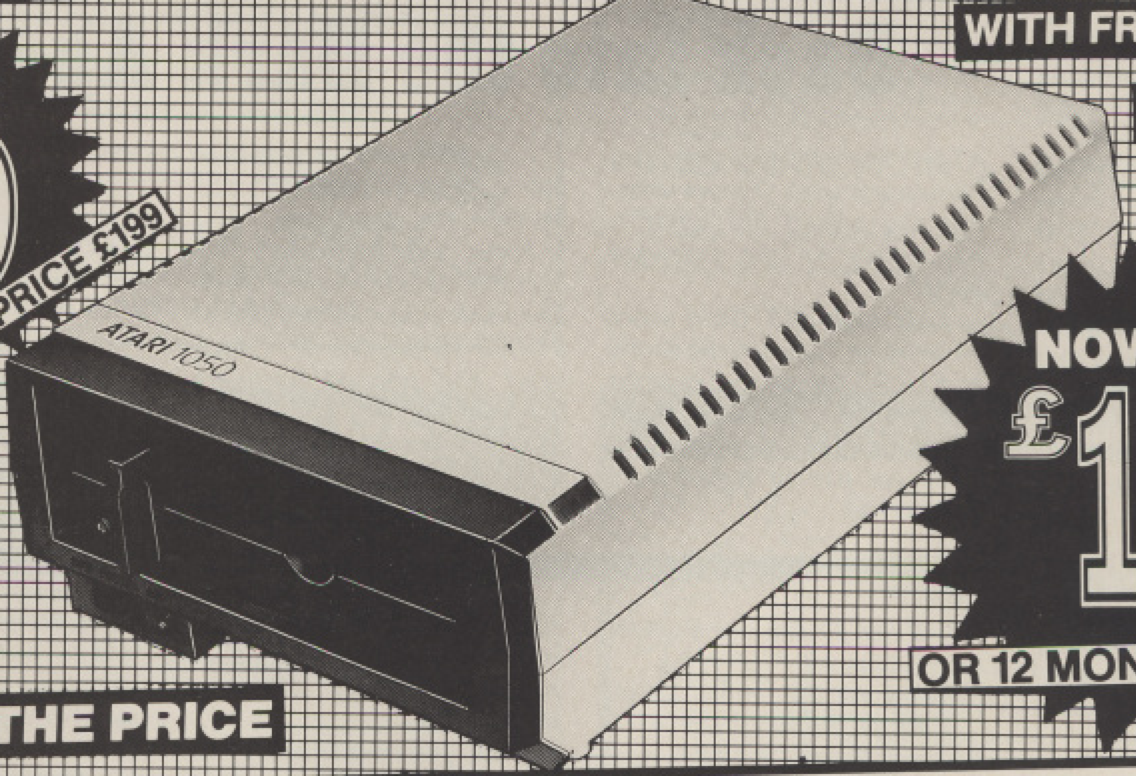
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NEWS FOR ATARI 8-BIT COMPUTER OWNERS

Silica Shop, the UK's leading Atari specialists, based in Sidcup Kent have announced a massive drop in the price of the Atari 1050 Disk Drive. The 1050 is compatible for use with the Atari 400/800 and XL/XE computers and allows access to a range of over 450 disk-based software titles. The 1050 comes with DOS 2.5, and can also be used with other Atari Disk Operating Systems, making it compatible with the complete range of Atari Corp and Third Party software for Atari 8-bit computers. The addition of a disk drive is a great enhancement to any computer system, increasing storage facilities and cutting information access time to seconds instead of the minutes taken by the 410 or 1010 data recorders. Many professional/business programs are only available on disk and not cassette. Until now, only a small proportion of Atari Computer owners have been able to benefit from the power and speed of the 1050. Now Silica are pleased to be able to offer the 1050 at a new low price of only £129 including VAT and FREE delivery. We also offer credit facilities allowing Atari owners to purchase it over 12 months for only £12.46 per month. The total purchase price over 12 months, with interest at a flat rate of only 16%, is only 12×£12.46=£149.52 (APR 32.3%). There has never been a better time for Atari owners to buy a Disk Drive!

SUPERB TECHNICAL SPECIFICATIONS

The 1050 is a dual density disk drive. This refers to the amount of information that can be stored on a single side of a disk. Three things determine the density of a particular disk format: The number of bytes in each sector, the number of sectors per track and the number of tracks per disk. Single Density formats give eighteen 128 byte sectors on each of their 40 tracks, thus giving a total capacity of 18×128×40 or 92,160 bytes. Double Density formats give sectors that are twice as large as the single density sectors and are capable of holding 256 bytes on each sector. This yields a capacity of 184 kilobytes per disk. There is also a third format, Dual Density which is the one used by Atari's new 1050 Disk Drive with DOS 3 and DOS 2.5. It has 26 of the 128 byte sectors on each of its 40 tracks, giving a total capacity of 133 kilobytes, which after formatting comes down to 127K. The 1050 is capable of running disks formatted in either single or dual density and can run either DOS 2, DOS 2.5, or DOS 3, this makes the machine completely compatible with all of the previous old style software. The 1050 is compatible with the 400/800 and the new XL/XE series of Atari computers. However, if you run a 400 or 800 you would need to already have at least 32K RAM of memory in your computer. The 1050 has a built-in 6507 micro processor and an onboard ROM operating system for automatic standby capability. It has automatic switching from single to enhanced density modes. It has a 'Disk Busy' indicator and up to 4 disk drives can be controlled at once. Included with the Disk Drive is the Owner's Manual, the DOS 2.5 Master Diskette, Reference Manual, I/O Data cable and Mains Adaptor. The 1050 disk drive comes with everything you need to plug it in and use it immediately.

FREE SOFTWARE

The new price for the 1050 disk Drive is not the only good news for Atari Owners. The Disk Drive now comes with three FREE software titles, in addition to the DOS 2.5 Disk and Manual. The first of these is The Payoff on disk, a new adventure game in which you play the leading role. On the reverse side of this disk is a demonstration program showing Atari's amazing sound and graphics. Also included is Home Filing Manager which will help you organise your files. It allows you to catalogue and file details of books, birthdays, your stamp collection or anything else which would normally require you to use filing cards. The software which comes free with the Disk Drive carries a normal retail price of £34.98 and is as follows:

HOME FILING MANAGER	£24.99
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SOUND & GRAPHICS DEMO	FREE
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UK with nearly 3,000 members.

The club run by Silica Shop is something different and, as far as I know, does not have a publication called Monitor.

The author of the reply was obviously under a misapprehension in believing that the UK Atari Computer Owners Club was the one referred to by Mr Dunstan.

I would not like to think that your readers, who may well have heard of Monitor magazine, are now under the impression that the club gives a slow or bad service to its members.

In fact we try very hard to keep our members well informed and up to date with Atari events. – **Roy Smith, Editor, Monitor, Rayleigh, Essex.**

Back into the Dark Ages?

ATARI are certainly providing computers with "Power without the price" but what is happening on the software front?

Last year US Gold were advertising Tigers in the Snow at £14.95 for several months pre-Christmas in Your Computer (you know, that magazine we use to read before Atari User).

I made several attempts to buy it from Silica Shop, who insisted the price was £40.

Now approximately 12 months later having seen Zoomsoft advertise this title at £14.95 (issue No 4), I took heart and phoned Software Express (dealers for Zoomsoft?). I was told the price was still forty odd pounds but . . . wait . . . I could have a CBM 64 version for £14.95!

Unless good, reasonably priced software is available for this Christmas the impetus of the Atari revival will be lost and a new dark age will descend upon us as we all fumble with our microdrive cartridges! – **C.R.J. Sunman, Frizington, Cumbria.**

● Oh no – not the microdrive cartridge!

DIY interface

I AM an Atari 800 owner interested in DIY interfacing.

There seems to be a host of addresses of firms offering both schematic diagrams and kits for all computers except Atari.

Please could you publish the address of any such firm which can provide these things, – **Roger Shone, Upton.**

● You want to contact Atari Corp. in Slough. They publish a book called "The Technical User Notes", which includes circuit diagrams, a full operating system listing, and the OS User Guide.

At present this covers the 400/800 range, but most of the information and all of that regarding use of ports, etc, is applicable to the XL/XE range.

Birmingham board

ABOUT two weeks ago we sent you a letter asking you if you would give our new Bulletin Board a mention in your magazine. We were most disappointed when it did not appear in your latest edition.

We are the Birmingham User Group, of which there is now 100 members, all Atari owners, and with your help we would like to see our Bulletin Board take off.

Here are the details again:

Central Birmingham Atari Bulletin Board,CBABBS running at 300 baud 24 hours a day, closed Thursdays. Sysop Mick Coleman. Would it also be possible for you to include each month a list of bulletin boards? We are sure many readers would like to see this. – **M.J. Coleman, Birmingham.**

The clubs' club

I AM endeavouring to set up a national Atari club for all users clubs. Basically, we hope to monitor all national user groups, compiling a newsletter for re-distribution to user groups of news and events throughout Britain.

I would be most grateful if you could let your readers know of this optimistic service, and if all user groups could submit their latest newsletter to me, together with an sae, we'll see how truly committed we all are about our Ataris. – **Paul Critchlow, 29 Tudor Road, Rock Ferry, Birkenhead, Merseyside, L42 5PH.**

Missing mode

ATARI User gets better with every issue, although it is not without it's faults.

In particular Mike Rowe's article on graphics modes fails to mention Antic Mode 3. This mode gives a 40 column 20 row text display with true descenders.

True, you have to write your own display list to use this mode, but that is true of four other modes on pre-XL Ataris.

I think it a great shame that this mode is so little used as it does give an exceptionally good text display.

As far as I know Speedscript 3.0 is the only program that uses this mode, although many character redefinition utilities offer the mode and often a script character set for use with it.

Atari do their best to hide the features of their computers, but please don't follow suit. – **Chris Bone, Balham, London.**

● Mike Rowe covers Antic Mode 3 and some other esoteric modes in this month's article, the last in his series.

Sharing

MY brother has an 800XL with 1050 disc drive. I have a Spectravideo which runs under CP/M.

Can we share our software between the two machines with some device?

If not I may be inclined to buy another 800XL and disc drive providing copies can be made from the discs. Please advise.

I shall also appreciate any information suggesting a better combination to obtain the desired results. – **J.M. Ari, Ahmadi, Kuwait.**

● No, you can't use the same software on both machines. As we've indicated previously, only Atari software will run on Atari computers.

Your suggestion of getting an 800XL/1050 seems the best alternative, though you might consider the new 130XE/1050 pack. You'll get twice the memory for very little extra cost.

You can copy any software which you've typed on your brother's machine, or has been given to you by other Atari owners, but you obviously won't be able to copy commercial games.

Quite apart from the fact that it is illegal, they will probably be heavily copy protected.

POKE list

I HAVE been an Atari computer owner for about a year now and I must say I am very happy with most of the things my 800XL does. The only downfall I can see is the so called Basic Reference Guide.

The thing I most want to know at the moment is a full list of the POKE statements and their functions.

Could you tell me of a book that contains these or will you be printing a listing in a future issue?

I found the POKE statements in the May edition very useful, but there must be a lot more. – **R. Thompson, Leeds.**

● You should get a copy of the revised edition of "Mapping the Atari" by Ian Chadwick and published by Compute! Books.

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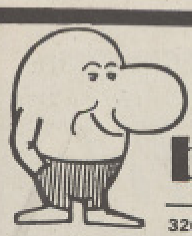
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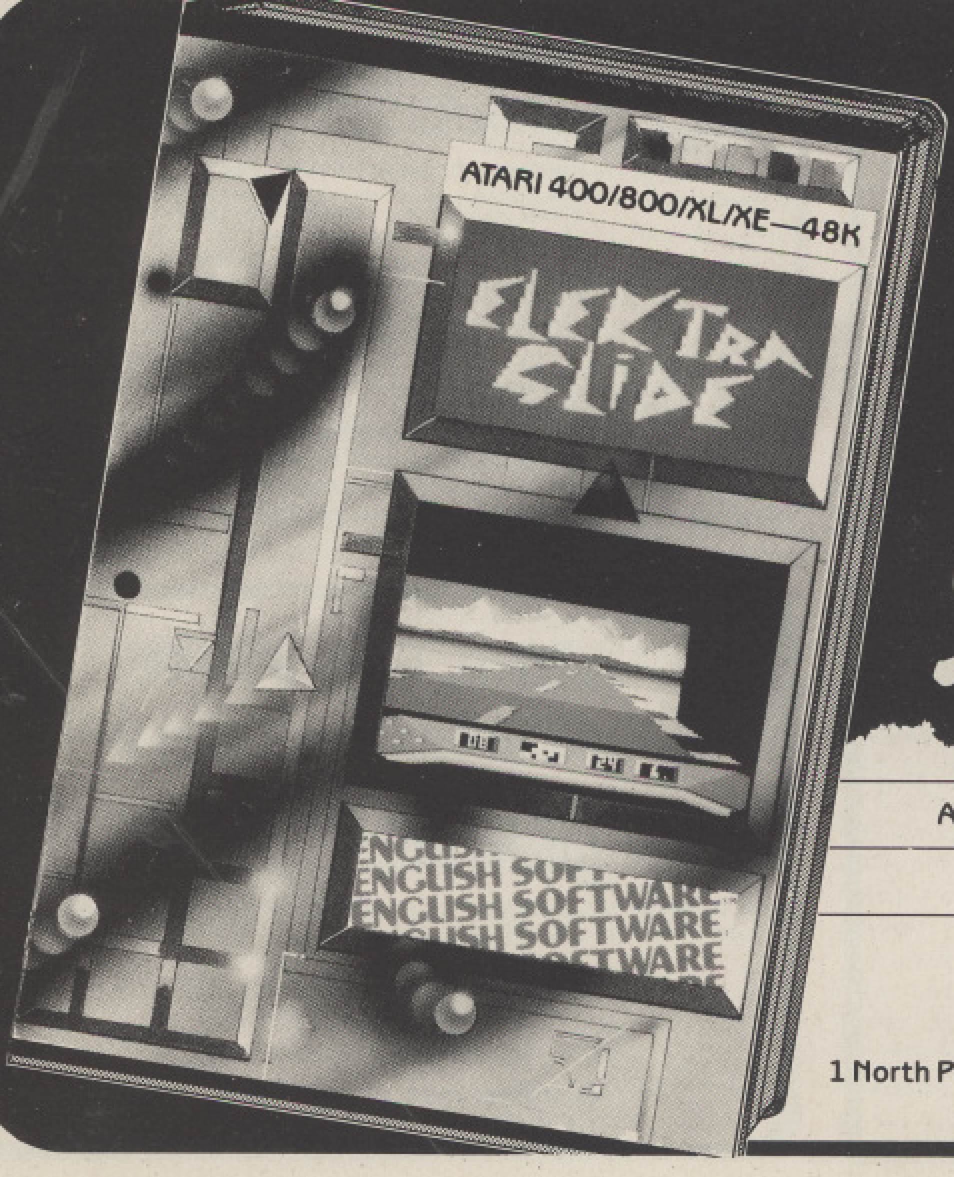
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June issue: In-depth analysis of the 130XE, Submarine, Adventuring, Random numbers, Software reviews, Frog Jump, Microscope, Sounds, Atari Insights – regular series of tutorials: Bit Wise, Beginners and Graphics, special 12 page feature on Communications.
July issue: Disassembler, Bomb Run, DOS 2.5, 17 Commandments, Adventuring, Display List Tutorial, Software reviews, Power Functions, Treasure Hunt, Keyboard Sounds, Microscope, Insights – Regular series of tutorials: Bit Wise, Beginners and Graphics.
August issue: In-depth analysis of the 520ST, program protection routines, Fruiti Gambler, Assembler, Touch Tablet programs, first look at Logo, Raider 1997, Dos 2.5 upgrade offer, Display List Tutorial, Microscope, Software reviews, Insights – regular series of tutorials: Bit Wise, Beginners and Graphics.
September issue: 8-page special on the 520ST, Mode 8 screen dump routine, Maze Munch, Data Maker, Display List Tutorial, 68000 addressing modes, list processing with Logo, Software reviews, Insights – regular series of tutorials: Bit Wise, Beginners and Graphics.
October issue: Computer Canvas graphics program, Updates for the RAW 6502 assembler, 130XE Ram-disc utility, first ST book on offer, Hex/Ascii memory dump utility, Pontoon, Software reviews, 68000 operating environment, Wraptrap, Insights – regular series of tutorials: Bit Wise, Beginners and Graphics.
November issue: Converse program, Bitwise operator utility, ST graphics examples, ST software list, Guy Fawkes game, Display List tutorial, Adventuring, Microscope, Software reviews, Insights – regular series of tutorials: Bit Wise, Beginners and Graphics.



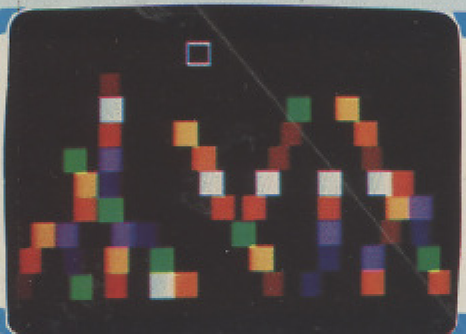
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DECEMBER: Countdown: Micro version of the famous TV game. **Get It Right!:** Atari User's own check-sum program. **Disco:** Son et lumière on your Atari. **Display List:** Demonstration programs. ***Plus:*** Freebie of the month – **Jane's Program** machine code entertainment.



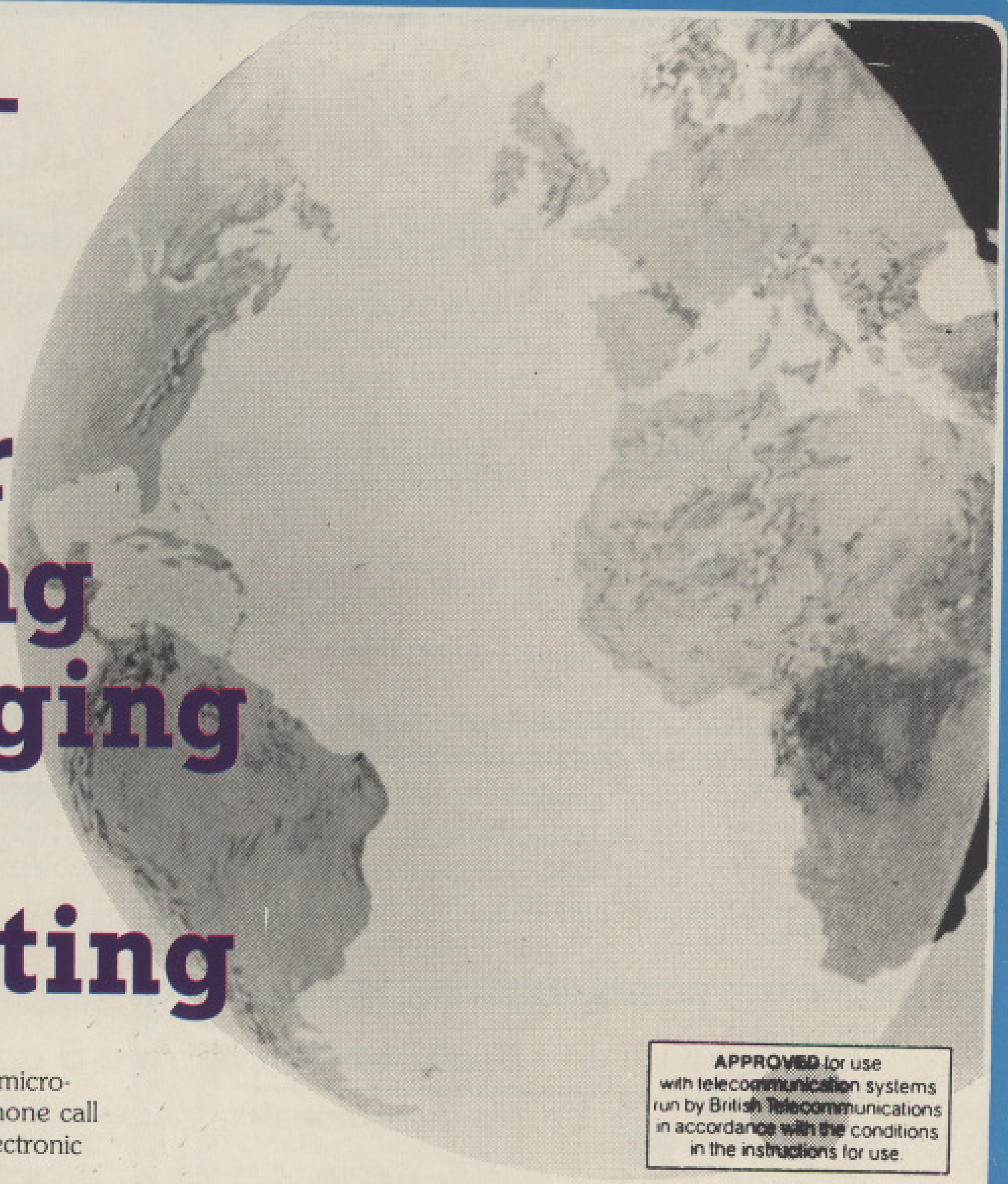
FREE

This month's freebie is a delightful machine code program that defies description. Drop blocks of colour, watch them bounce, and listen to the musical sounds. Called Jane's Program by its author Douglas Crockford, it's one of the most unusual programs we've seen in a long time.

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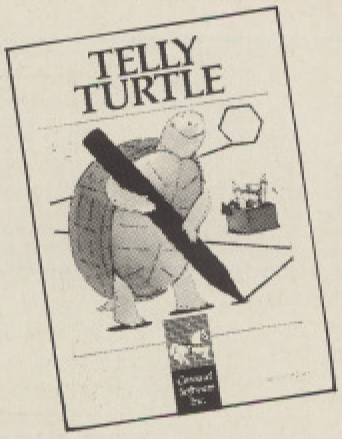
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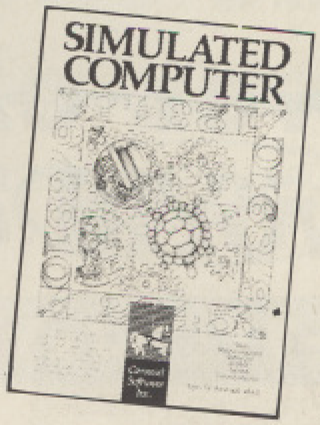
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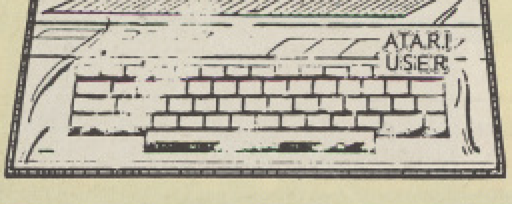
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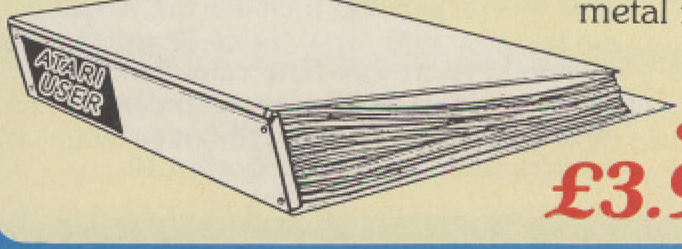
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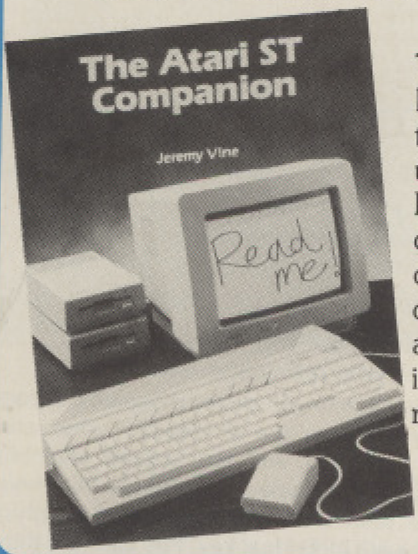
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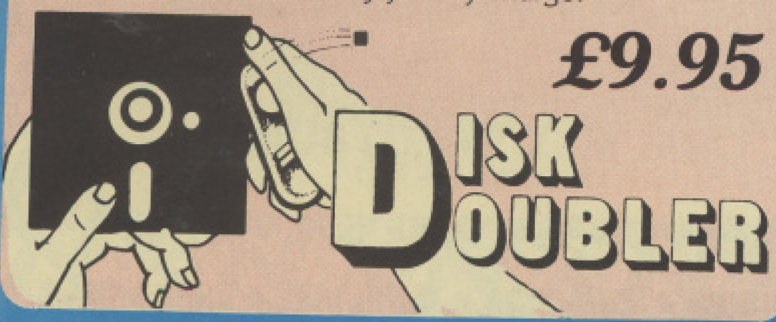
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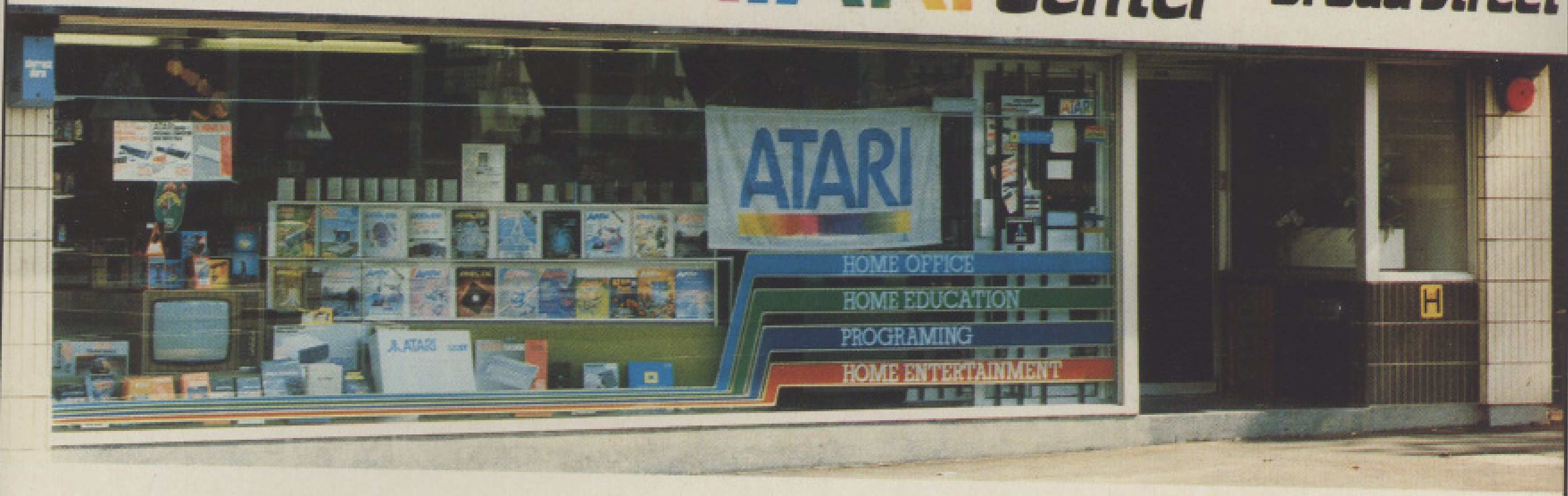
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A COMPREHENSIVE SELECTION OF SOFTWARE ALWAYS IN STOCK

YOU'VE READ THE REST



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AS ATARI SPECIALISTS WE OFFER KEENEST PRICES AND LARGE UP TO DATE STOCKS

TRY OUR MAIL ORDER SERVICE GOODS DESPATCHED BY RETURN --- *NO WAITING*